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Original Communications.

A CONTRIBUTION TO OUR KNOWLEDGE OF FEVER, AND THE AGENTS WHICH PRODUCE OR ARREST IT.

By Drs. H. C. Wood, E. T. Reichert, and Hobart A. Hare.

INTRODUCTION.

THIS research grows out of a statement, which was some time ago made in a German journal, that pepsin injected into the blood would produce fever, and is accompanied by very little discussion of the literature of the subject, because the field which it especially occupies has previously received little attention. The ultimate object of the research has been to throw light upon the nature of fever and upon the relation of the febrile reactions of the body to organic substances. Of course the literature of fever is enormous; but to have entered upon any general study of it would have carried us far beyond our present intention.

The calorimeter which we have used in these experiments is in most respects similar to that employed by Dr. H. C. Wood in his research on fever, but differs in being designed to take out all the heat absorbed by the air after its entrance into the inner box, and thus to avoid the loss of time in observation and calculation which is involved in Dr. Wood's plan of measuring the amount of

air used and its temperature before and after its exit, and then calculating the heat abstracted by such air. Metal tubes are, in our calorimeter, coiled in the space between the two boxes, where the water is during the working of the instrument; and, as the temperature of the water is kept a little lower than that of the air, any heat absorbed in the central box by the air is given up to the water. In order to test the accuracy of this calorimeter, we devised an arrangement by means of which known quantities of the city gas could be burnt in the inner box with the apparatus set up and the air-pumps at work. Under such circumstances, we find that the water in the outer chamber rises with remarkable regularity with the combustion of equal quantities of gas. We believe, therefore, that the calorimeter used at a temperature of three or four degrees below that of the external air is an instrument of precision, provided that great care be exercised to see that, at the beginning of the experiment, the calorimeter itself is of uniform temperature throughout, and that the water in it is thoroughly stirred from time to time, especially when the temperature is about to be taken.

Part I.—Fever-Producing Agents.

In studying the action of pepsin upon the animal organism, when introduced directly into the blood, we have made use of an article furnished by Hance Brothers & White, of Philadelphia, and also of the commercial "soluble pepsin" sold by Fairchild Brothers, of New York. The symptoms produced have been uniform, but varying according to the amount and to the strength of the pepsin employed; the pepsin of the same manufacturer varying in its activity.

In the dog, when pepsin, rubbed up with water but not filtered, is injected into the blood, death from failure of the circulation may result at once if the dose has been large enough, as is shown by the following experiment:

Experiment 1.—A very small dog.

Time. M. S.	Pulse.	Art. Press. Mm. mercury.	Remarks.
0.	230	140–150	
1.	.....	.....	Began injection of Fairchild's pepsin, 1 gramme in solution; only about half of it was thrown into jugular vein.
1.15	235	150–160	Injection finished.
1.24	.....	80	Pulse cannot be counted, so small. Respirations full and deep.
1.30	.....	75	No pulse. Apparatus so arranged in this experiment that Zero of arterial pressure is 75.
1.33	.....	.....	Still occasional deep respirations, but no pulse.

The respiration is also profoundly affected. At first it is excessively hurried, and becomes very full and struggling. There are often at this time violent convulsions. The respiration after a shorter or a longer period of stormy rapidity becomes slow, it may be with great suddenness, and then is abolished altogether. These changes may, especially in the rabbit, dominate the depression in the circulation, and produce a vaso-motor spasm with great rise of the arterial pressure, even at a time when the smallness of the pulse shows the still existing cardiac weakness. As an example of this we give the following experiment:

Experiment 2.—Full-grown rabbit.

Time. M. S.	Pulse.	Art. Press.	Resp.	Remarks.
1.00	230	120	90	Very slow injection of 1 c.c. of water, containing 1 grain Fairchild's pepsin, began into jugular vein.
1.15	250	102	120	
1.24	.....	78	132	Injection finished.
1.30	240	84	210	Directly after injections ceased violent respiratory struggles came on.
1.45	160	60	212	Pulse scarcely to be made out on tracing.
1.50	?	56	180	Pulse not perceptible.
1.57	.....	120	185	Pulse not perceptible.
2.04	.....	.....	.....	Respiration stopped; general convulsions.
2.09	240?	214	none.	Pulse so small and irregular cannot be fairly counted.
2.22	.....	.....	.....	One deep respiration, very full and slow.
2.28	.....	.....	.....	Convulsions continue: during one the canula torn out of artery.
2.30	.....	.....	210	Respirations small, irregular.
2.40	.....	.....	.....	Respirations going on with regularity.

Animal died about fifteen minutes later. A spectroscopic examination of blood drawn just before death showed normal oxyhæmoglobin.

The disturbance of respiration and the convulsions which follow the injection of pepsin are, we believe, due to plugging up by particles of the pepsin of the blood-vessels of the medulla. When Fairchild's pepsin is used they are exceedingly severe, with the article prepared by Hance Brothers & White they are much less pronounced. Even when rubbed with water most carefully, Fairchild's pepsin gives a mixture containing numerous coarse particles, whilst the other pepsin is an almost impalpable powder. Further, we have produced similar disturbances of respiration by injecting very finely-powdered dried meat into the jugular vein, as in the following experiment:

Experiment 3.—Rabbit.

Time. M. S.	Art. Press.	Resp.	Remarks.
0.00	130	84	
0.01	.....	.....	Injection begun of a very small quantity, a grain or two, of meat.
0.09	100	.....	Injection finished. Respiration just stopped.
0.13	75	.....	Respirations renewed.
0.18	170	210	Very irregular and short respirations, convulsive tremors.
0.29	170	.....	Respirations practically none.
0.35	85	.....	Respirations very shallow and irregular.
1.10	100	.....	Only one respiration in thirty seconds.

No attempt at respiration after this, although pressure kept up for one-half minute.

The fall of arterial pressure which follows an injection of pepsin we believe to be due to an influence exerted upon the heart. In Experiment 2 the sudden rise of pressure from 56 to 214, which was produced by arrest of respiration at a time when the pressure had fallen from 120 to 156, shows that the vaso-motor system is not affected until very late in the poisoning.

When the amount of solid pepsin introduced at one time is not large enough to produce such profound result as those we have chronicled, but still is sufficient to cause death in a very short time, the animal becomes quiet and excessively weak; the bodily temperature falls, and death occurs in general asthenia. When small amounts of the pepsin are employed, there may be a decided shivering fit, lasting fifteen minutes to half an hour, in which the animal tries to get near the fire, and seems to be suffering from a sensation of coldness. This condition is succeeded by fever, lasting some hours, which, on its gradual subsidence, leaves the animal in apparent good health; or, if the dose has been properly proportioned, hæmaturia and excessive purging come on, and the animal dies in collapse.

Our next efforts were directed towards finding out what it is in commercial pepsin which produces the symptoms. The hæmaturia we at first supposed was due to a digestion or destruction of the blood-corpuscles by the ferment. But we have experimentally determined that in the blood of the poisoned animal the spectrum is that of normal oxyhæmoglobin, and that when blood is digested with pepsin outside of the body, at a temperature of 100° F., for twelve hours, there is no alteration of the spectrum, and no disappearance of the red disks or appearance of their débris. Comparative studies made with Mannassein's blood-counting apparatus of the blood-corpuscles, before and after the digestion of the blood with the pepsin, and careful microscopical examinations failed to show any alterations in the number or character of the corpuscles.

When the pepsin powder was injected into the blood death was produced by a few grammes, but if the pepsin were thoroughly rubbed up with water and filtered, the filtrate, which, of course, contains the active pepsin, could be injected, in quantities representing twenty grammes of the commercial pepsin, into the jugular vein of small dogs, without producing fatal results. We have also never been able to cause bloody diarrhœa or hæmaturia with this solution, and we therefore believe that the hæmaturia and bloody flux are the results of infarctions in the kidneys and intestinal walls, such infarcts being due to the minute solid particles of the commercial pepsin.

In order to determine whether it is the soluble or insoluble portions of commercial pepsin which produce the fall of arterial pressure, two experiments were made with a clear liquid obtained by rubbing up Fairchild's pepsin in water, and filtering through a double filter. The experiments are as follows:

Experiment 5.—Very old dog; weight, 12 pounds.

Time. M. S.	Pulse.	Art. Press.	Remarks.
0.	135	140–160	
1.	130	140–160	Began injection of 10 c.c. saturated solution.
1.15	208	110–115	Injection finished.
1.10	300	75–80	
1.50	300	80–90	Injected 10 c.c. as before.
2.	330	60–70	
5.	236	135	

Experiment 6.—Very old dog; weight, 20 pounds.

Time. H. M. S.	Pulse.	Art. Press.	Remarks.
12.10	216	140–150	Injected 12 c.c.
12.10.10	.....	.....	Injection finished.
12.10.10	300	70–100	
12.10.25	.....	75–90	
12.10.50	.....	80–100	
12.11.30	.....	120–180	
12.30	140	140–165	Injected 1 gramme of Fairchild's pepsin rubbed up in water.
12.30.05	192	98–105	
12.33.30	192	120–130	

These experiments indicate that the depression of the arterial circulation, caused by an injection of commercial pepsin, is largely

the result of the mechanical action of its insoluble particles. A hasty large injection of filtrate does produce a temporary fall of arterial pressure, but this is speedily recovered from, and, in truth, does not occur when the injection is practised with only moderate rapidity, unless very large amounts of the filtrate be used. At the same time, when solid pepsin is used, the effect upon the circulation varies greatly, and embolism of the coronary artery of course suggests itself as a plausible explanation of the cardiac failure when the action is excessive.

The pepsin fever is produced by the injection of the filtrate from commercial pepsin, as is shown by the following experiments, which have been, we may add, frequently repeated with consonant results:

Experiment 7.—October 20; carriage-dog; weight, 23 pounds.

Time. M. S.	Rec. temp.	Remarks.
9.20	104.6°	Injected 25 c.c. of a strong filtrate from concentrated pepsin.
12.30	105.4°	Vomited several times before twelve o'clock.
1.45	106°	
3.	104.5°	

Experiment 8.—October 24.

Time. M. S.	Rec. temp.	Remarks.
9.50	104.3°	Filtrate from 7.5 grammes of concentrated pepsin.
10.15	.....	Shivering fit.
2.	107.3°	

Experiment 9.—October 26; small yellow pup; weight, 10.5 pounds.

Time. M. S.	Rec. temp.	Remarks.
11.50	104.2°	Injected 40 c.c. of filtrate from 11 grammes of Fairchild's pepsin.
12.45	107.4°	Dog quiet.
1.45	108.3°	

Experiment 10.—October 26; dog.

Time. M. S. *	Rec. temp.	Remarks.
11.15	104.4°	Injected filtrate from 11 grms. of commercial pepsin.
1.	106.8°	
1.40	105.4°	
3.15	104.2°	

The rapid development of fever after pepsin injections, and the absence of any signs of a catalytic action in the blood, suggested to us that it is not the pepsin itself, but something contained in it, which causes the fever. We therefore made the following experiments, in which the ferment was destroyed by boiling:

Experiment 12.—October 29; yellow dog; weight, 16 pounds.

Time. M. S.	Rec. temp.	Remarks.
10.45	104.4°	Injected 110 c.c. of filtrate from 11 grammes of concentrated pepsin which had been boiled for ten minutes.
11.50	104.4°	
3.45	106.3°	

Experiment 13.—October 30; brown bitch pup.

Time. M. S.	Rec. temp.	Remarks.
9.25	103.7°	Injected filtrate from 12 grms. of pepsin which had been boiled for ten minutes.
11.4	108.4°	
1.	108.8°	
2.	107°	

These experiments have been repeated a large number of times with uniform results. They undoubtedly prove that the pyrogenic agent in commercial pepsin is not the pepsin itself, but some contaminating principle.

Having determined that the poisonous principle of commercial pepsin is not the ferment, it was our next endeavor to discover, if possible, the nature of the poison.

On adding to the boiled and filtered solution of pepsin an excess of strong alcohol a copious precipitate was obtained, which, when dry, yielded an amorphous substance entirely soluble in water. Experiments were then made with this material to determine its physiological properties. The principle itself, as will hereafter be shown, is of the nature of a peptone. The experiments are as follows:

Experiment 14.—Dog; weight about 10 pounds.

Time. M. S.	Remarks.
10.05.	Rectal temperature 105.8°.
10.10.	Injection into the jugular of 0.5 gramme of peptone.*
10.15.	Dog excessively weak, apparently dying.
10.45.	Rectal temperature 103.5°; the dog still very sick and apparently dying.
11.	Dog improving very decidedly.
11.10.	Improvement still continues.

* One ounce of Hance Brothers & White's concentrated pepsin, which we understand contains fifty per cent. of sugar of milk, yielded about ten grains of the dried peptone. If dried at too high a heat, a portion of this peptone becomes insoluble in water, and the toxic power is correspondingly diminished.

Time. M. S.	Remarks.
11.45.	Dog worse; unable to stand; has passed a little bloody serum from the bowels. There appears to be slight dyspnœa. Rectal temperature 98.1°.
11.55.	Dog dead.

Experiment 15.—Dog.

Time. M. S.	Remarks.
10.30.	Rectal temperature 106.5°; injected 0.11 grm. of peptone which had been digested for ten days in absolute alcohol and then dried. This peptone was one-sixth of that which had been obtained from 20 grammes of concentrated pepsin, and therefore represented about 3½ grammes of pepsin.
10.35.	Dog has been vomiting; is very weak, and can scarcely walk; respiration deep.
11.38.	The dog seems to be dying; has Cheyne-Stokes's respiration.
11.05.	Rectal temperature 106.9°; the dog much improved; is breathing normally.
11.45.	Dog is quiet, but not so depressed; temperature 107.9°.
12.45.	Rectal temperature 107.9°.
2.45.	Rectal temperature 107.9°.

Experiment 16.—Weight of dog 42.5 pounds.

Time. H. M. S.	Drug.	Art. Press.	Pulse.	Rec. temp.	Remarks.
12.21	.....	190–210	144		
12.21.10	Peptone	180–200	150		
12.21.20	0.05 grm.	166–180	300		
12.27	.....	140–160	138	.....	Dog quiet.
11.29	.....	160–168	144	.....	Breathing labored, respiration hurried.
12.32	.....	170–174	132	.....	Absolutely quiet.
12.35	.....	170	138		
12.35.10	0.15 grm.	170	120	.....	Injection begun.
12.35.20	.....	170–150	168		
12.35.30	.....	194–174	132	.....	Violent breathing.
12.35.50	.....	184	120	.....	Injection ended.
12.40	0.2 grm.	184–168	.....	.....	Injection begun.
12.40.10	.....	192	114		
12.40.50	.....	180–190	.....	.....	Injection ended.
12.46	0.2 grm.	186–190	132	105.5	Injection begun.
12.46.20	.....	200	.....	.....	Injection ended.
12.47	.....	.....	.....	105.7	
12.50	.....	190–194	.....	106.	
12.54	.....	220–200	78		
12.54.10	.....	210–190	78	106.2	
1.02	0.2 grm.	190–202	.....	106.2	Injection begun.
1.01	.....	196	72	.....	Injection ended.
1.15	.....	180–190	108	105.8	
1.25	.....	.....	.....	105.5	Blood coagulating well. Dog killed.

These experiments prove that the material which we obtain by the precipitation of a boiled and filtered solution of commercial pepsin is the pyrogenic poisonous principle of the pepsin; and, also, that when this principle is injected into the blood in certain amount it produces very distinct fever, without a pronounced effect upon the arterial pressure; but that when larger quantities are employed a condition of excessive asthenia is at once produced, accompanied by a very marked fall of the bodily temperature, and soon ending in death.

We have determined that the pyrogenic principle of commercial pepsin is of the nature of a peptone. It yields a perfectly clear solution with water, which has a neutral reaction. The peptone gives the following reactions:

Boiling, no effect.

Proteid color-reactions. — Xanthoproteic, good.
Millon's reagent, good.
Biuret's, good.

Mercuric chloride, good.

Ferric chloride, none.

Cupric sulphate, none.

Neutral lead-acetate, good.

Tannic acid, good.

Absolute alcohol, a precipitate soluble in water.

Strong nitric acid, none.

Strong acetic acid, none.

Strong hydrochloric acid, none.

This peptone also gives a very slight precipitate with ferrocyanide of potassium and strong or dilute acetic acid. And thus has some resemblance to the *a* peptone of Professor Meissner, from which it differs in yielding a much smaller amount of precipitate with reagents just mentioned. For it we propose the name *pepsin-peptone*.

It has been suggested by a friend that the poisonous principle of commercial pepsin is allied to sepsin, obtained in 1868 by Drs. E. Bergmann and O. Schmiedeberg (*Centralbl. für Med. Wissens.*, 1868, 497) by a complicated process from decayed yeast. The work of these investigators was gone over by Dr. Anton Schmidt (Thesis, *Das Sepsin*, Dorpat, 1869), who obtained the sepsin as a pure snow-white crystallized substance, of which 0.025 gramme was sufficient to kill a very large dog. It is plain that sepsin is of the nature of a ptomaine, and that it differs absolutely from the substance which we obtained in that it is soluble in alcohol, whilst pepsin-peptone was procured by precipitating it from its watery solution by the addition of alcohol. Pepsin-peptone also differs in a similar way from the poisonous principle which Professor L. Brieger (*Zeits. f. Physiologie Chemie*, vii. p. 277) obtained from ordinary peptone by extraction with alcohol. It is of course very probable that Brieger's extract was of the nature of a ptomaine.

The results of Brieger suggest the possibility that pepsin-peptone owes its poisonous prop-

erties to the presence in it of a contamination. To discover if possible such contaminating substance, we digested a specimen of the pepsin-peptone with amyl alcohol, filtered, and evaporated in a capsule to dryness, when a mere trace was left. On similar treatment with chloroform, petroleum ether, amyl alcohol, sulphuric ether, nothing was dissolved. The failure to obtain any organic crystalline principle by these solvents seems to us to prove that the pepsin-peptone which we used is free from ptomaine. That the residue which was left after the evaporation of the ethyl alcohol is not the poisonous principle is shown by the fact that in Experiment No. 15 the pepsin-peptone which was used had been digested for ten days with a great excess of alcohol, which must have removed from it everything soluble in that liquid.

In order, however, to make a further test of the matter, basic acetate of lead was added to the solution of pepsin-peptone in distilled water. A white flocculent precipitate formed, but redissolved upon the addition of more of the basic acetate. To this solution ammonium hydrate was added, and the white precipitate which fell was collected on a filter-paper, washed with water, separated from the filter-paper, and suspended in water. Sulphuretted hydrogen was then passed through the water to precipitate the lead. The sulphide was filtered off, and the filtrate evaporated on the water-bath to dryness. The residue was very small in amount, was not crystalline, and on testing was found to be largely composed of lactose.

The filtrate obtained from the precipitation of the basic acetate of lead by ammonia was warmed, and sulphuretted hydrogen passed through it until all the lead in it was precipitated. The solution was then filtered, and the filtrate evaporated to dryness slowly on a water-bath. A considerable quantity of a brown gummy mass containing minute crystals was obtained. On testing physiologically this mass it was found to be active. Twelve centigrammes of it injected into the jugular vein of a small cat produced a rise of temperature of nearly three degrees.

The crystals obtained in the final product of the studies just reported were believed to be ammoniacal. It is plain that if the peptone itself should come out of this process it would be in the final mass obtained, and that unless the peptone be entirely destroyed this mass would be physiologically active. The fact, therefore, that this mass was active is no evidence whatsoever that the crystals were of the nature of a ptomaine, or were the original poison.

The method of obtaining the final gummy mass was such as to strongly indicate that the crystals in it were ammonium acetate, formed by the decomposition of the basic acetate of lead by the ammonium hydrate. In order positively to prove this, we added the basic acetate of lead to a fresh solution of pepsin-peptone until a clear liquid was obtained, warmed this liquid, and passed sulphuretted hydrogen through it until no further precipitation occurred, filtered, and evaporated the filtrate to dryness; the gummy mass left contained no crystals. As the process through which the pepsin-peptone was put was identical with that by which the crystals were obtained, except in the addition of ammonium hydrate, it is a necessary inference that these crystals were an ammoniacal salt.

That certain peptones when introduced into the blood act as poisons is not an altogether new idea. In the *Archiv f. Phys.*, 1880, Dr. Adolf Schmidt-Mulheim announced the fact that large quantities of ordinary peptone thrown into the blood of the living animal prevent its coagulation, and, at the same time, lower very greatly the arterial pressure by, as he believes, but does not prove, a direct paralyzing influence upon the walls of the blood-vessels. Along with the fall of the blood-pressure great restlessness appears, soon followed by muscular weakness, and, finally, paralysis of the limbs. In the last stages of the poisoning secretion of urine is arrested and convulsions may occur. Influenced by the statements of Schmidt-Mulheim, M. Winckler, a Bavarian veterinarian, proposes, in the *Archiv f. Wissen und Praktische Thierheilkunde*, 1883, Bd. lx. p. 419, a theory to account for the "subacute cerebritis" frequent among horses in certain parts of Germany.

This disease appears to be closely allied to the so-called *loco* disease which is common in domestic animals in certain districts of the Western United States, and which is usually attributed to one or two species of the genus Astragalus. In Germany the affection under consideration is believed to be the result of excessive feeding upon certain leguminous plants, which plants are, however, not poisonous. Parallel to this are the results of experiments which we have made with Astragulus sent from the far West, as *loco* or *crazy weed*. The extracts of these plants we found to be entirely inert. Winckler believes and apparently proves that the symptoms of the so-called subacute cerebritis are not the result of

any brain inflammation, but are the outcomes of a constitutional affection. He also believes that the poisonous principle which causes this disease is a peptone formed in the blood by the action upon its fibrin of the ferment which was discovered as an abundant principle in leguminous plants by Gorup-Besanez, who also found that it has the property of forming peptones with fibrin. The theory of Winckler is that when an animal feeds on an excess of these leguminous plants there is sufficient absorption of this ferment to form in the blood a peptone, which is the cause of death. The Astragalus of the West is a leguminous plant, and probably contains the ferment of Gorup-Besanez. If the theory of Winckler be correct, the loco disease is probably also a peptone-poisoning. Unfortunately, Mr. Winckler does not prove the truth of his theory. He simply by general considerations renders it probable. As the loco disease is a matter of very great importance to the stock-raising interests of this country, a research should be made upon this point. It would be a very simple matter to determine the truth or falsity of the theory of Winckler.

The importance of the poisonous properties of peptone is much enhanced by the fact that these compounds have been found to be produced in the internal organs during certain diseases. E. Salkowski obtained a peptone from the liver of a patient dead of leucocythemia (*Virchow's Archiv*, 116), an observation which has been confirmed by Bockendal and Landwehr (*Virchow's Archiv*, Bd. lxxxiv. p. 561). Salkowski also found peptone in the spleen, the liver, and the kidneys of a case of acute yellow atrophy of the liver (*Virchow's Archiv*, Bd. lxxxviii. p. 394). Sotnitchewsky (*Zeitsch. für Physiologie Chemie*, Bd. iv. 217) finds that peptone is constantly present in the lungs of persons dead of fibrinous pneumonia; whilst M. Muria (*Virchow's Archiv*, Bd. ci.) asserts that these principles can always be discovered in the viscera of animals killed by phosphorus, and has obtained them in quantities from the liver, spleen, and uterus of patients dead of puerperal fever. Finally, Fischel (*Archiv für Gynakologie*, Bd. xxiv.) finds that the peptones are constantly formed during involution following childbirth.

It is a growing conviction with clinicians that many of the symptoms which accompany various acute constitutional disorders are not produced directly by the germs or other poisonous agents which are the immediate cause of the disease, but are caused by substances which are formed during the vital processes provoked or altered by the original poison. There has been also a tendency to believe that these secondary poisonous principles are usually of the nature of alkaloids belonging to the so-called class of ptomaines. Our experiments of course do not, in any way, disprove the existence of ptomaines, or their activity for evil. They certainly indicate, however, very strongly that the pyrogenic poisons of these constitutional affections are at least, in some cases, peptones. It has been proven that peptones are pyrogenic agents, and that at least some of them act when present in very small quantities. It has also been proven that peptones are found in the viscera of persons dead of various constitutional disorders, and it is very probable that these peptones during life pass into the blood and exert a powerful febrifacient influence upon the organism.

(To be continued.)

*LANOLIN, A NEW FATTY SUBSTANCE; ITS PHYSICAL PROPERTIES AND THERAPEUTIC USES.**

By Prof. Oscar Liebreich, Berlin.

At the present time the object of experimental pharmacology is twofold: on the one hand we have to investigate remedies which have already gained a fixed position in practical medicine, while, on the other hand, we must study products which have been made the subject of experimental and pharmacological inquiry, but which have not yet been tested practically.

It is this experimental pharmacological method which more especially claims my attention, and I am of opinion that it is a most important mode of investigation; at the same time, I readily admit that the results of clinical experience must never be lost sight of.

The principal aim which I have in mind is to make not only abstruse physiological or chemical experiments, but to turn these experiments to account in the light of my pharmacological studies. Even those which appear to have a purely theoretical interest become the origin of practical discoveries.

Pharmacology must unite with all those branches of medicine, and pursue an exact experimental course. There can be no doubt that products obtained by the pharmacological method must inspire more confidence than

* Read before the British Medical Association at the recent meeting at Brighton, England.

those which are simply introduced by empirics.

There is a great difference between recommending a drug which has been studied from a pharmacological point of view, and only introducing it in order that it may be tried in practice without previous experiments. In the latter case a certain substance is introduced, and the decision on its merits is left to those who try it on their patients and who judge by the results of their statistics.

One of the branches of pharmacology which has been most neglected is that which refers to drugs used in the treatment of skin-diseases.

In consequence of our pathological studies into the nature of diseases, the local treatment has become more and more important.

The method which I have employed, and the substance itself which makes the subject of my paper, are so simple, that I should be unwilling to occupy your time to present to you some important considerations which will have soon to be studied by anatomists and physiologists. These studies may lead to new discoveries concerning the composition and metabolism of our body.

I wish to speak to you of a substance which I have called lanolin, the biological importance of which I have already had occasion to mention in this country.

Lanolin is a cholesterine fat, which differs from the ordinary fat of the pamisculus adiposus through its containing, instead of glycerin, the brilliant crystals of cholesterine, which are so well known to every microscopist. Besides cholesterine, these fats contain other substances which are similar to cholesterine, but which have nothing in common with glycerin. In order to give you an idea of the differences which exist between these two sorts of fat, I may mention that cholesterine fats are not decomposed by boiling with alkaline solutions,—that is to say, they do not form soaps; while, on the other hand, glycerin fats are easily split into soap and glycerin when treated in the same way. The decomposition of glycerin fats into fatty acids and cholesterine, or cholesterine-like substances, can only be produced by the action of a strong solution of alkali in alcohol. We have, therefore, to deal with a very stable chemical compound.

I have found yet another difference between these two sorts of fat. Lanolin absorbs water very readily. By simply stirring together a cholesterine fat and water, more than one hundred per cent. of the latter can be incorporated with it, and a soft yellowish mass is formed, which is the lanolin properly so called. I have named lanolinum anhydricum the cholesterine fat deprived of water. Neutral glycerin fats, vaseline and petroleum fat, do not absorb water, or only absorb it in very small quantity.

Lanolin can be extracted from the fat contained in the wool of sheep; this fat when unpurified is called wool oil.

It has been known for a very long time among the agricultural and cattle-breeding populations, and its old designation was *œsypus*.

I could not, without taking up too much of your time, give you the history of this œsypus. I shall simply tell you that œsypus was already used in the time of Herodotus. Dioscorides describes the preparation of œsypus from wool, and his description is reproduced in most of the pharmacopœias published up to the eighteenth century.

It was also used by the ancients as a cosmetic, and Ovid mentions it in his Ars Amatoria. The Roman ladies anointed their faces and skin with œsypus brought from Athens, and this in spite of its repulsive nature. Lanolin continued to be employed during the Middle Ages, as Milton has pointed out to us. He has found the œsypus mentioned in the Sloane edition of Hieronymus Srascatorius.*

Œsypus was bound to be abandoned, as the impurities which it contained, especially rancid fatty acids, often produced irritation through the skin. Many substances, called by fantastic names, have been recommended as substitutes for œsypus, but they all contained fatty acids, and many impure substances of this nature have been produced since my researches, and the name lanolin, which I have introduced for a definite substance, is improperly applied to them. In my opinion the best method consists in separating the lanolin from its emulsion by centrifugal action. The emulsion must be previously sterilized by the action of heat and alkalies. Distillation can, unfortunately, not be used, as it causes a partial decomposition and an increase in the quantity of fatty acids. When lanolin was first introduced by me I recommended that it should be mixed with fat; but I am pleased to be able to withdraw this opinion, as I have succeeded in removing from lanolin the sticky

* Hieronymi Srascatorii, Syphilis sive morbus galliens, Londini, 1884 (publications of the Sloane Society). Interea si membra dolor convulse malignus Torqueat Œsypo propera lenire dolorem mastichinoque olio.

cholesterine fats. It has thus become possible to obtain a substance which, in the state of lanolinum anhydricum and of lanolin, possesses the necessary softness. Referring to what I said in the beginning of my communication, I must now examine if lanolin is, unlike vaseline and fats, a substance similar to the fat contained in the skin and keratinous tissues.

My researches have led me to believe that it is always present wherever keratinous tissue is formed.

As to the origin of this cholesterine fat, it may be asked whether it is secreted by glands or formed simultaneously with the keratinous tissue. I can answer that the horny tissues are full of lanolin even where there are no glands to produce it. The degree of brilliancy and elasticity of the horny tissue is in direct proportion to the amount of lanolin contained in it. I must not forget to say, that some researches made by French experimenters have been of great interest to me while I was working on the subject. Berthelot* has shown many years ago that it is possible to combine synthetically cholesterine and fatty acids. He has also foreseen that this fat might be found in nature. I have found that the researches of Hartmann have brilliantly confirmed those of Berthelot. I have, moreover, shown that lanolin is nearly always present in keratinous tissue.

On the other hand, Ranvier has discovered in the skin microscopical fatty globules, which have been called by him eleidin. We can also mention in this place the very important investigations of Waldeyer. We have here, possibly, the beginning of a series of researches which may lead ultimately to a more exact knowledge of the formation of lanolin in the cells of the skin. I say, therefore, that the constant presence of this fat in keratinous tissue, and the discovery of the substance itself, are the true therapeutical indications.

I have first of all shown that lanolin can be rubbed into the skin with great ease. When this rubbing is repeated several times the skin becomes distinctly softer. This application of lanolin to the skin has been found very useful for massage by Dr. Ewer.† It is a great advantage that lanolin does not require to be removed with soap and water after massage. I may mention also that the easy penetration of the skin by lanolin explains the good results obtained with it in seborrhœa sicca. It stands to reason that the permeability of the skin varies in different persons; it is evident also that an epidermis already saturated by its natural lanolin cannot be impregnated with more fat as easily as a dry epidermis. Dr. Pawlowsky has therefore recommended to free the skin from its natural fat by means of ether before using the lanolin. There is no doubt that gray ointments prepared with lanolin are preferable to the ordinary ointments. This is the opinion of the well-known authority in Aix-la-Chapelle, Dr. Brandis.‡

It is certainly better to draw conclusions from a few carefully-observed cases than from statistics, which are more or less misleading in cases of this kind.

The following may prove interesting. One of my colleagues in Berlin prescribed to a patient an inunction of gray ointment made with lanolin. He observed already after two inunctions an irritation of the skin and the apparition of acne pustules. Wishing to enlarge my experience, I examined the ointment, and found no trace of lanolin in it. The chemist admitted that I was right, and said that a mistake had been made. After the disappearance of the skin eruption neutral carefully-prepared lanolin mercury ointment was used, and no return of the irritation was observed. I took special interest in a case of sycosis vulgaris, which had been wrongly diagnosed as parasitic sycosis. The patient, a young man of 19, had suffered five years from the disease, and had been treated without success not only by all the usual means, but also by a preparation of lanolin. The latter, however, was of bad quality, and a rapid improvement took place as soon as the pure substance was employed. I could mention to you many other cases in support of this view, but I think that the unirritating nature of lanolin is already generally admitted.

I wish now to make a few observations concerning the absorption of drugs through the skin. It must not be supposed that a substance applied to the skin, even in combination with lanolin, can be absorbed as quickly as through the intestine. It is also necessary to remember that a comparatively large quan-

* "D'après diverses observations il ne paraît pas impossible que quelques-uns de ces éthers, le composé stéarique notamment, existent à l'état normale soit pathologique dans l'économie animale." Berthelot, Chimie organique fondée sur la synthèse, tom. i. p. 161. Paris, 1860.

† Die Anwendung des Lanolins bei der Massage.—*Deut. Med. Wochen.*, July 8, 1886, Berlin.

‡ Behandlung der Syphilis. Berlin: Hirschwald, 1886, 3d edition.

tity must be applied externally in order to produce the same general effects as a small quantity given by the mouth: the dose of mercury, for example, must be sixty times larger when used in the form of the ordinary gray ointment than when administered internally. Although lanolin mercury ointment is more readily absorbed than the ordinary one, it is quite certain that the quantity of mercury used must be much larger than what one would give internally. I must now explain shortly, why absorption through the skin is slow. The superficial layer of the skin is the stratum corneum; then comes the stratum lucidum; then the granular layer, in which lanolin is probably formed; then the deep cells of the epidermis; and at last the papilla, with one vascular loop. When fat is rubbed into the skin, it finds only this one loop through which it can be absorbed. In the intestine, on the contrary, every villus contains numerous blood-vessels; hence the great difference in the power and rapidity of absorption.

I must end with a few remarks on a point of importance concerning the use of lanolin, which shows very evidently the difference between it and ordinary fat. When lanolin is used on mucous surfaces it never forms a scab; this has been, I believe, first noticed by B. Fraenkel, of Berlin. It may be explained in the following way: lanolin has a great affinity for water, and this peculiarity explains why it adheres intimately to mucous membranes; fat and vaseline, on the contrary, remain separated from the mucous surface by their natural watery secretion.

It would lead me too far if I were to consider in detail the distribution of lanolin in the body, but I have reason to believe that it is found not only in the keratinous tissues but also in the blood, liver, and other organs; never in the pamisculus adiposus. Further researches will elucidate this question.

It has been objected to me that lanolin, which was known to the ancients and used for centuries, would not have been abandoned if it had been really useful. To this I answer, that what they used was œsypus,—that is to say, impure wool oil, which has many disadvantages and dangers. I cannot, therefore, lay too much importance on the fact that pure neutral lanolin must be used; not those substances which are sometimes falsely called lanolin, but which are in reality only impure acid wool oil, or products of distillation which contain still larger quantities of acids.

We see something analogous in the case of opium, after it had been used in the form of electuarium theriaca,—that is to say, of an impure compound of opium. It fell into discredit for a long time, partly also through prejudice, and you know that Paracelsus was the first to reintroduce it in its pure state under the name of laudanum.

Thus in lanolin I introduce to you a substance which, like many others, is old as history in its primitive forms, new as our most modern research in its derivative form. To transform the old, to apply to it the alchemy of science, to purify it, and to utilize it for the benefit of mankind, this is our aim. This has been my labor. I have the ambition and the belief to have rendered a service to humanity. A new fatty substance, neutral, miscible with water, highly absorbable by the skin, is a desideratum. Such is lanolin, which I introduce to you, and for which I predict a long career of great usefulness in the dermatological therapeutics and in the hygiene of the skin.

TEA AND ITS ALKALOID, THEINE.

By Thos. J. Mays, M.D., Philadelphia, Pa.

THE tea-plant is a shrub growing from twenty to thirty feet high, and is indigenous to the southern part of Asia, but is extensively cultivated in China, Japan, and in South America, as well as to some extent in the United States. Its use as a beverage dates from a very early period in Chinese history, but the Greeks and Romans knew nothing of it, and it was only introduced into Europe about the year 1657. The botanical origin of tea is Thea Bohea, T. viridis, T. sinensis, and T. assamica, and a few hybrids; and the many varieties of tea in the market are prepared by selecting young or old leaves, and subjecting them to various processes of treatment. Thus, green tea is obtained from young leaves, which are roasted over a wood-fire for a few hours after being plucked; and black tea is made by allowing the leaves, after being gathered, to lie in heaps for ten or twelve hours, and undergo a slight fermentation, and then are slowly dried over a charcoal fire (Blyth). Hyson, Young Hyson, Gunpowder, and Imperial are the most popular kinds of green tea, and Oolong, Pekoe, and Souchong are the best-known black teas.

The chief constituents of tea are an essential oil, boheic acid, tannin, and *theine*, the last of which is the active principle of the

plant, and exists in very nearly the same proportion in both varieties of tea.

Tea was probably first used as a medicine. It is a very interesting fact that the development of most civilized countries is associated with the history of certain plants which have originally been employed in the form of hot infusions in cases of ailments, and afterwards became domestic beverages. Our own mountain tea (Gaultheria procumbens), and the New Jersey tea (Canothus Americanus), and other plants are instances of a similar kind. Then, again, poor or insipid water, or scarcity of food, may be the means of leading people to employ hot vegetable infusions for the double purpose of making their drinking fluid more palatable and healthful, and of extracting any nutriment or stimulus that may exist therein. The former object is well exemplified by the inhabitants of the northern portion of China. The river Pehio, which flows through this part of the country, is so heavily laden with vegetable and animal impurities that it emits an offensive smell. This water the Chinese never drink except in the form of tea, and then they secure entire immunity from its unhealthfulness.

It is very strange that customs which survive centuries, and which are apparently of entire insignificance, should in a latent state contain an important germ of truth. This is strikingly true of tea. Never having received a great deal of scientific investigation, it was not believed to possess much more virtue than that which it furnishes as a stimulating beverage; yet from a very remote period moist tea-leaves have been regarded as a very valuable local application by the popular mind. It is a common practice in our own day, especially in inflammation and injury of the eyes, face, etc., to apply tea-leaves for the purpose of reducing the local inflammation and the abnormal sensibility. It was after such reflections, about a year ago, when everybody, like myself, was infatuated with the idea of discovering a new local anæsthetic, that I began to investigate the physiological action of theine, and soon found that its pain-relieving power was no less remarkable when introduced beneath the skin than was that of cocaine when applied to the surface of the body. Not only was its analgesic action well demonstrated by these experiments, but the important fact was also developed that its physiological action was markedly different from that of caffeine, with which it was hitherto considered identical.

During the time and after my first experiments were made, I was unaware that theine and caffeine were manufactured indiscriminately from tea, coffee, kola-nut, or Paraguay tea, and that they were sold out of the same bottle, and labelled according to the desires of the customers. Inquiry, however, soon established this fact, and a complete review of my former work became, of course, necessary. What I then used for theine was undoubtedly theine, for it so happens that it is cheaper to manufacture the alkaloid out of tea than out of coffee; hence very nearly all the theine and caffeine in the market is theine. The nature of that which I used for caffeine is more uncertain. It could not have been pure theine, for in that case I could not have obtained the varying products which I did, but it may have been theine mixed with caffeine.

In view of this unsatisfactory condition of the ordinary theine and caffeine for experimental purposes, Mr. William Harris, of Philadelphia, manufactured both alkaloids for me from tea and coffee, respectively, and quite recently I received the same alkaloids made from the same source from Merck, of Darmstadt. After investigating these preparations very thoroughly, I found that the difference in their physiological action is greater than I was led to suspect in my earlier experiments.

Theine and caffeine were investigated experimentally by Aubert, Albers, Amory, Bennett, McKendrick, Burnett, Léven, and others, and, with a single exception, they all concluded that they are identical in their action, but not one of them succeeded in finding the anæsthetic property of theine. This, I think, can only be explained on two grounds,—first, that they used the same alkaloid under different names; second, if they employed separate alkaloids, their methods of investigation were not sufficiently accurate to show the special action of each agent. Léven, who it appears experimented with the separated and genuine alkaloids in 1868, showed that theine produced convulsions in frogs, while caffeine did not; and that the lethal dose of theine was larger than that of caffeine. This is confirmed by my own inquiry. From my experiments on frogs, which will not be given here in detail, I drew the following conclusions:

They agree in the following—

1. They first affect the anterior extremities.
2. They diminish respiration.
3. They produce hyperæsthesia during the latter stage of the poisoning process.

They differ in the following—

1. Theine principally influences sensation, while caffeine does not.

2. Theine produces spontaneous spasms and convulsions, while caffeine does not.

3. Theine impairs the nasal reflex early in the poisoning process, while caffeine does not, if at all, until in the very last stage.

4. The lethal dose of theine is larger than that of caffeine.

I hope the above indicated differences will be obvious enough to convince even the most sceptical that theine and caffeine can no longer be regarded as identical, so far as their physiological action on the frog is concerned. In order to show to myself, as well as to others, that there was a decided difference between the two, and that I did not practice any unconscious self-deception, I frequently tested the contents of two numbered vials, one of which contained theine and the other caffeine, but which were only known to me by their numbers, and I never failed to designate the true nature of each specimen after testing its action on the frog. This is, indeed, a crucial experiment, and it very clearly demonstrates that the toxicological tests of experimental physiology are more accurate and delicate than those of physics and chemistry combined.

The argument which has been advanced against my deductions that the theine and caffeine employed by me were probably not chemically pure, must, I think, fall to the ground, when it is taken into consideration that precisely identical results were obtained from two separate manufactures of both alkaloids, against neither of which the charge of contamination can be brought. In the early part of my experimental review I did use preparations of both which were not altogether free from the coloring-matter of the plants, but I found the same differences as those which were brought out subsequently by the purer specimens. However, if the objection of impurity is still urged, it is incumbent on those who make it to manufacture such specimens of both alkaloids which will satisfy their ideal of purity, and have them subjected to a proper test for the purpose of finding out whether they fail to give a differential physiological reaction.

Enough evidence has now been adduced to show that theine and caffeine, while they have properties in common, also differ so widely in others that their separate manufacture becomes imperative in order that they may be more fully investigated both physiologically and clinically; and it further teaches that a knowledge of the chemical constitution of a substance is a very feeble and misleading guide to its physiological action.

The action of theine and caffeine on man in a separate state has not yet been sufficiently studied to draw any comparison between them, and it is quite obvious that, owing to the promiscuous manufacture of the two alkaloids, it is very difficult to decide whether, in the so-called cases of caffeine poisoning, the effects were due to theine or to caffeine. My own experiments on man with theine show that the subcutaneous injection of moderate doses (one-third of a grain) produce numbness of arm and hand below seat of injection; a feeling of coldness; an occasional disturbance of the temperature in the member under its influence; a slight reduction in the pulse-rate; no impairment of motion; and no intoxication of the brain. The anæsthesia was much more marked in some individuals than in others, and the temperature disturbance was irregular. Out of four cases in which the temperature was tested, it showed no difference in one, and in another one the uninjected hand was slightly higher (0.4° Fahr.) in temperature than the injected one. In two there was quite a marked fall in temperature,—one 0.8° Fahr. and the other 1.2° Fahr. in the hand of the injected arm than in that of the uninjected one. And, strange to say, the hand which showed the greatest depression in temperature experienced the least anæsthesia.

Physiological investigation therefore demonstrates that theine possesses the power of producing anæsthesia, and clinical experience has already proven that this property is sufficiently potent to be of the most marked advantage in the treatment of painful diseases.* In addition to the cases there detailed, I have since then treated many varied kinds of pain with the greatest satisfaction. Not only have I found it efficacious in all cases of neuralgia, but it is equally curative in many cases of pain in the extremities of rheumatic origin, lumbago, etc. It also gives unmitigated relief to the intense pains and local spasms which are met during the progress of locomotor ataxia. I have also known it to modify very markedly the pains incidental to carbuncle and to other inflammatory processes. It does not only relieve the pain, but indirectly also improves locomotive power.

The action of theine is almost entirely limited to the region below the seat of injection. There can be no doubt that after its introduction it enters the general circulation and is

* See my article on "The Analgesic Action of Theine," in the *Medical News* for April 17, 1886.

conveyed throughout the whole body, yet, so far as my experience extends, there is not the least evidence to show that in man it affects any portion of the body above the seat of its injection unless it is given in immoderate doses. In virtue of this localized action theine possesses a marked advantage over other anodynes. Morphine, atropine, and their analogues chiefly exert their influence through a central and not through a peripheral action; hence the after-effects which so often follow the employment of the latter agents is absent in theine, and must not be left out of account in making up an estimate of the comparative value of these remedies.

The consumption of tea is enormous. Great Britain alone consumes eighty million pounds annually, and the United States about seventy million pounds in the same time. It is evident that an agent used on such a gigantic scale must either confer a benefit or an injury on the whole civilized world; hence it is of great interest to inquire into its probable effect on the human economy. Much has been written and spoken on this subject. Quite recently Dr. Bullard, of Boston, read a paper on "Chronic Tea-Poisoning"* before the Suffolk District Medical Society, which elicited very favorable comments both from the meeting before which it was read and from the medical press, and if the conclusions reached in his paper can be fully substantiated it necessarily follows that tea is a *most insidious* poison, and should be expunged from the list of our hitherto unsuspected and innocent beverages. I think, however, that the importance of the subject demands that the data upon which the argument of the paper is founded should be exposed somewhat to the light of sober criticism before the deductions derived therefrom are ultimately accepted.

Dr. Bullard bases his statistics on an examination of one hundred and sixty-three dispensary patients who were supposed to suffer from the toxic effects of tea, and for the sake of comparison he takes as a standard the symptoms which were attributed to the poisonous action of tea by Dr. Morton, who had investigated the symptoms and conditions of five tea-tasters, and also tested the action of tea on himself as far back as 1879.† Dr. Morton concludes that the continued and immoderate use of tea led to headache, vertigo, ringing in the ears, tremulousness, nervousness, exhaustion of mind and body, with disinclination to mental and physical exertion, increased and irregular action of the heart, dyspepsia, diminution of the amount of urine and of urea, and retardation of the metamorphosis of tissue. Now, these conclusions, we have a right to assume, are based on conditions found in persons who were most certainly exposed to the almost continuous influence of tea, and here, if anywhere, typical symptoms of tea-poisoning should be found. Therefore, with no inclination to demand a yield under the color of authority, we are entitled to ask of Dr. Bullard that when he renders judgment against an agent of almost universal consumption, it shall be done in accordance with the standard which he erects for his guide. This he evidently failed to do, for, of the most prominent symptoms laid down by Dr. Morton as being indicative of chronic tea-poisoning, less than one-half of the cases tabulated showed the least trace. Thus, of headache, only thirty per cent. suffered; of vertigo and ringing in the ears, none; of nervousness, forty-two per cent.; of exhaustion of mind and body, etc., eight per cent.; of palpitation of the heart, forty-two per cent.; of dyspepsia, fifty-two per cent.; while the most important and the most certain of all the physical signs noted by Dr. Morton, viz., the diminution of urine and of urea, are left entirely out of contemplation by Dr. Bullard. But even these figures become very seriously impeached when it is considered that one hundred and fifty-one of the one hundred and sixty-three persons examined were females; for it is a very notorious fact that the great majority of that sex, especially among dispensary patients, are liable to headache, nervousness, palpitation, dyspepsia, etc., whether they drink tea or not.

But the most serious fallacy in the paper seems to me to be the small quantity of tea which is supposed to be capable of producing such toxic symptoms. Out of sixty-eight patients complaining of tea-poisoning noted by Dr. Bullard, thirty-nine drank from two to five cups of tea a day only, and twenty-nine from five to eight a day,—an average of 4.8 cups per day. Now, if we allow one-third of a grain of theine to each cup of tea (which is certainly a very liberal allowance), the average amount of theine imbibed per day by the first series of cases was not quite one and two-thirds grains, while the latter series consumed from two to two and two-thirds grains of theine per day.

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* *Boston Med. and Surgical Journal* for April 8, 1886.

† "Toxic Effects of Tea," by Dr. W. J. Morton, in *New York Medical Record* for July 12, 1879.

These figures entirely contradict my own observations in the hypodermic use of theine. Since I became interested in a study of the physiological and clinical action of this alkaloid, I have found that one-half of a grain constitutes a moderate and an ordinary sufficient dose as an anodyne in neuralgia, but I frequently inject as much as two and one-half grains without experiencing anything except the happiest results. To one patient, who was suffering from the most intense neuralgia of both lumbo-sacral and left cervico-brachial plexuses, which was accompanied by sleeplessness, spasm of the muscles of both legs and of those of the left arm, I gave two and one-half grains of theine subcutaneously in four different localities along the spine, with instantaneous relief to the pain and the induction of sleep during the following night. This amount was injected daily for twenty-one days in succession, at the end of which time he was almost entirely free from the pain, improved in appetite and sleep, and felt better in every way. In another case of locomotor ataxia, I injected two and one-half grains of theine in different spots along the spine every other day, chiefly for the purpose of relieving the pain and contractions in the extremities, as well as the constriction around the chest. It removed all these difficulties, and made the patient feel more comfortable than before.

The transparency of the argument becomes manifest at once, when we consider that two and one-half grains hypodermically are at the very lowest calculation equivalent to ten grains given by the mouth; and if this amount can be given with perfect immunity at one time, as in the cases just cited, how can two and two-thirds grains, which was the largest amount of theine imbibed by any of Dr. Bullard's patients, produce any toxic symptoms, and that, too, when it is taken in divided doses during the course of twenty-four hours?

That tea is not such a poisonous agent as one would infer from reading Dr. Bullard's paper, is also confirmed by Dr. C. L. Dana,* of New York, who, following the investigations of Dr. Morton, already alluded to, made similar inquiries regarding the influence of tea upon tea-tasters, and he was led to form conclusions diametrically opposed to those of Dr. Morton, and which materially vitiate the truthfulness of the standard with which Dr. Bullard compared the symptoms of his patients. In all, Dr. Dana examined ten persons who were engaged in that pursuit, five of whom were old men, had been in the business for more than half of their lifetime, some of whom tasted from two hundred to four hundred cups of tea in a day, and in none of these cases—all of which, according to Dr. Dana's statement, imbibed about four grains of theine daily—was there the slightest evidence of tea-poisoning. The late Dr. Beard † also investigated chronic tea-poisoning, and found that his results were in complete harmony with those of Dr. Dana.

I am sorry to see room for so much fault-finding in a paper on which a great deal of time and labor has obviously been bestowed; but in the interest of fairness to an agent which is a household pet in almost every family in the land, I feel called upon to make the above adverse remarks, not in the belief, however, that tea-drinking has no poison-line, but that Dr. Bullard has far undershot it. Moreover, I trust that he will realize this, and renew the research in the near future with the same but better-directed enthusiasm that he displays in the present work.

1716 CHESTNUT STREET.

* See Dr. Dana's paper in *N. Y. Med. Record*, January 24, 1880.

† "Nervous Exhaustion," by Geo. M. Beard, p. 151.

THE ESSENTIAL NATURE AND SCIENTIFIC THERAPEUTICS OF CHOLERA INFANTUM.

BY F. C. HERR, M.D., OTTAWA, KANSAS.

"ALL science," says Emerson, "has one aim, namely, to find a theory of nature. Whenever a true theory appears it will be its own evidence. Its test is that it will explain all phenomena."

In the kaleidoscopic history of medical science it has been the fate of theories to rise and fall in rapid succession. What to-day is deemed adequate to the ends of scientific medicine, to-morrow is cast aside as inadequate to that end and worthless. This want of permanency in medical theories offers a very ready explanation of the present uncertain and chaotic state of therapeutic science. The patient labors of many investigators have extorted from nature's storehouse a multitude of facts, which, if properly interpreted and applied, might give us a comprehensive theory of medical practice. "Of what use," says Dr. John Tilt (Change of Life, p. 61) "is a great array of facts in medicine unless they

lead to a sound theory explaining their production and preventing their occurrence. Stones only cumber the ground till the architect puts them in place."

Perhaps no graver subject could enlist the attention of the physician than that which concerns the health and life of infants during the hot summer weather. The frequency and the fatality of cholera infantum, as well as the uncertainty of therapeutics in controlling its history, invest it with profound interest, and mark it as a subject requiring careful investigation. Whatever of misgiving and of ill-success may be reputed to the past in our relation with this disease, it is obvious to the writer that the present outlook threatens to revolutionize old hypotheses and old modes of practice, and yield results which will justify the declaration that "cholera infantum is *now* a manageable disease."

The present senior editor of the THERAPEUTIC GAZETTE long ago paved the way for a more enlightened practice within the scope of febrile diseases, and it seems clear to the writer that any scientific classification of disease must assign cholera infantum to the group of pyrexias. It may go a long time before this view will become the accepted doctrine with the profession, but facts are daily accumulating which fortify this opinion, and its ultimate acceptance is assured beyond the peradventure of a doubt. Tennyson has well said, "Science moves, but slowly, slowly, creeping on from point to point." Smallpox has lost its terrors through the power of prophylaxis in vaccination. Hydrophobia has been handicapped by the experimental researches of Pasteur, and one by one will these mortal foes of health come within the limit of controlling power. But we *must* break the moorings which link us to the ancient philosophy of our art. The medical practitioner who draws the inspiration of his therapeutic power from text-books will find a sad sequel to his summer's experience with cholera infantum. The recognized therapeutic resources of the past have been painfully ineffective in their application to this disease, and this inefficiency grew out of mistaken conceptions regarding the etiological and pathological basis of the disorder. The popular belief has been the professional belief in respect to the causation of cholera infantum, and the practice has been in accordance with this belief, namely, that food and dentition were the active factors in the production of cholera infantum. I own that food may be the sole excitant of morbid action in the gastro-intestinal system, but food alone does not originate that morbid entity which we designate cholera infantum. Keating says (Archives of Pediatrics, May, 1885), "We have varieties of disease dependent on the character of the food, and others upon the condition of the individual;" and Trousseau declares (Clinical Medicine, vol. ii. p. 456), "Indigestion will be caused and maintained which will lead to diarrhœa, and this diarrhœa, again, under certain circumstances will become the starting-point of cholera infantum." It would be interesting to know just what circumstances Trousseau here refers to, as it is obvious he does not regard food a potential factor in the etiology of infantile cholera. Out of the importance which has been accorded this food consideration as an elementary factor in the causation of this disease has grown the doctrine that the effectual prophylaxis of cholera infantum demands a judicious, well-regulated, and proper dietary. Dr. Samuel S. Adams says (Archives of Pediatrics, May, 1885), "I am convinced that many more children would be saved during various meteorological changes if more attention were paid to alimentation as a prophylactic measure." It would be a work of supererogation to urge the importance of careful feeding in these diseases of child-life. The theme has been over-written time and again, and Dr. Adams himself says (*loc. cit.*, p. 270), "If I were content to quote the best authorities on pediatrics, I could fill the pages of the largest medical journal with the most diversified opinions of men we have learned to venerate, and in the end find that each of our authorities claimed success for his method of feeding." The tendency has always been too much in the direction of exalting into perilous prominence the dietetic factor in the production of these affections. Engrossed with this thought, other lines of thought were shut off, and progress necessarily retarded.

We have never correctly apprehended the nature of cholera infantum, either as a pathological entity or in its etiological relations. The alimentary derangements which constitute a large part of the symptom-picture of cholera infantum do not compose the essential primary disease. The initial point of the morbific process is outside the alimentary system, and the phenomena of exhausting diarrhœa and emesis are consecutive in the chain of pathogenetic action. Whatever relation food does sustain to the affection is the relation of irritation, of aggravation, rather than that of causation. In this point of view it

does not lose any of its importance, but it serves to enlarge our conception of the real rôle which it does play. Day after day, week after week, and month after month the same system of methodical feeding is practised with tender infants by tender mothers for the avowed purpose of saving the little ones from the tortures and dangers incident to careless feeding. Suddenly, without premonition, the infant is seized with violent symptoms of cholera infantum. The physician is hastily summoned. He comes, looks wise, feels the pulse, takes the temperature, and asks, "What has the child eaten?" thus implying the probable accountability of food for this sudden manifestation of disorder. The systemic disturbance is profound, and Trousseau (Clinical Medicine, vol. ii. p. 455) has well said, "The local lesions in cholera infantum are insufficient to explain the profound disturbance of the whole system." The clinical history of the affection clearly shows that, as a morbid entity, it comprises more than a mere derangement of the gastro-intestinal system. In the interpretation of the phenomena which characterize the disorder, what importance shall we attach to the profound enervation, the stupor, the sunken eye, the depressed fontanelle, and the general pallor? Are not these phenomena far more grave than the diarrhœa and the emesis? Do they not denote a measure of disorder which mere diarrhœa and vomiting do not produce, and does not a scientific, comprehensive explanation of all these phenomena refer them to the same proximate cause? We must extend our researches in the sphere of life-phenomena, study more closely the relationship between physiological and pathological processes before we can answer all the complex inquiries which the subject suggests. What Drs. John Tilt and Hanfield Jones have done for the diseases of women in their studies of the pathology of the ganglionic nervous system, it remains for some student of pathology to do for these diseases of child-life. To slightly paraphrase a sentence of Dr. Tilt's, I may say that cholera infantum should be thought of as having its *fons et origo* in the ganglionic nervous system. Dr. Goodhart affirms (Diseases of Children, p. 62) that "the sympathetic system is so involved in cholera infantum as to allow the transudation of serum from the blood-vessels into the intestines, and lead to alterations in the functions of the heart, lungs, and kidneys." This same involvement of the sympathetic system permits transudation of serum into the ventricles, and leads to alterations in the functions of the brain. In the Fisk Fund Prize Essay (by C. E. Banks) for 1879 it is shown that the brain is seriously involved in cholera infantum, and that there is present usually a marked degree of peripheral vascular injection of the brain substance. Hartshorn says (Reynolds's System of Medicine), "Undoubtedly many cases of so-called chronic inflammation of the bowels, as of other parts, consists really in non-inflammatory hyperæmia or passive congestion, the result of vaso-motor paresis, and consequent relaxation and distention of the vessels without exudation, although with altered secretion and increased epithelial desquamation." As long ago as 1866, Meigs and Pepper advanced cogent reasons for regarding the pathology of cholera infantum as a primary affection of the ganglionic nervous system. It has seemed to the writer that in the diarrhœa of emotion is found a happy illustration of the *modus operandi* of the cholera infantum. "The hot bath, by paralyzing the vaso-motor and cardiac inhibitory nerves, will give rise to quickened pulse, with lower tension, frequent respiration, paracardial oppression, giddiness, faintness, and muscular languor" (Bartholow). Charles D. F. Phillips says (Materia Medica and Therapeutics, vol. i. p. 136), "Large draughts of cold water, by giving shock to the abdominal sympathetic, may cause nausea, faintness, actual syncope, and in some cases even death." These references bring to mind familiar experience, and they aptly illustrate how a variety of factors may be potential in exciting the same or identical morbid phenomena. The depression, and weakness, and pallor, and intestinal relaxation, with emesis, which sometimes come with the suddenness of surprise to infants in apparent good health, can be ascribed to no other influence than a paretic condition of the vaso-motor nervous system. Extreme, long-continued elevation of atmospheric temperature, as observed in temperate and tropical climates, supplies all the conditions necessary for the evolution of cholera infantum. The writer, who then resided in Philadelphia, has a vivid recollection of the ravages wrought by high temperature during one week in July, 1876. Five hundred deaths occurred in this week in infants under two years of age. The total mortality from all causes and at all ages often does not exceed three hundred per week. It remains an undetermined question just how far meteorological changes are responsible for these disorders. Dr. James Frederick Goodhart, in discussing the influence which barometric

changes have upon summer diarrhœa, says, "What such reactions may indicate etiologically; how far, that is to say, such conditions indicate changes in the food, and how far act immediately upon the system, it is impossible to say, and, happily for the purposes of therapeutics, though the facts are worthy of recognition, the treatment is unaffected."

This brings me to the consideration of the therapeutics of cholera infantum. If I only had to speak of Dover's powder and chalk mixture, bismuth and ipecac., and mercury with chalk, etc., I should refrain from saying anything in the belief that these matters have been fully written upon by numerous authors. Nor do I propose to discuss at length that large class of agents which have met with favor in the profession by reason of their energetic astringency, or by virtue of their influence over peristaltic action. Except in rare cases, I regard these remedies as contraindicated in the treatment of cholera infantum. Their employment has yielded no results which justify definite conclusions, and in the hands of one therapeutist simple chalk mixture is the available remedy, while with another the whole range of astringents from bismuth to tannic acid and the salts of lead, are brought into requisition. The evident purpose of all these agents is to modify intestinal peristalsis, and control serous effusion by counteracting the relaxation which is present. To accomplish this end does not meet the purposes of successful therapeutics. In simple entero-colitis, from local irritation, it may be quite sufficient to administer bismuth, or opium, or bicarbonate of sodium with rhubarb, or a solution of morphine with aromatic sulphuric acid, or mercury and chalk with ipecacuanha, and perhaps in some cases strong solutions of nitrate of silver, as suggested by Trousseau. But in the therapeutics of cholera infantum it will be found that these remedies do not meet the pathological indications. They may control the excessive discharges, but they will not correct the disordered nervous system, which is the underlying causal factor in the disease.

It will be found from a careful study of the subject in its entirety that those medicines are most available which, from a study of their physiological action, are found to influence the ganglionic nervous system in the direction of stimulation. If the theoretic consideration of vaso-motor paresis is the essential pathological condition of this disease, then it follows that the indications for treatment are met in the employment of agents which antagonize this morbid state. I may mention in this class of agents the following ones as the more important: aconite, belladonna, arsenic, nux vomica, opium, hydrocyanic acid, caffeine, and cocaine. I am well aware that the employment of these remedies in the treatment of cholera infantum is not the established practice, but it will not for that reason be contended by any one that they are without efficiency. It is obvious that without a clear apprehension of the pathological nature of any disease its therapeutics must be a matter of pure speculation. But here we have an hypothesis which explains all the phenomena of this disorder, and upon it may be builded a practice which will yield the results which science long has sought.

Dr. W. Byford Ryan (*American Practitioner*, May, 1885) says, "The indications for treatment in cholera infantum are, first, to relieve visceral engorgement; second, to maintain capillary action of the entire economy; third, to give tone to the muscular and mucous coats of the bowels; and fourth, to supply proper nutriment." These indications Dr. Ryan believes are largely met by the administration of belladonna, and in my own experience it has yielded excellent results. Belladonna is indicated here by reason of its action antagonizing that morbid process which is expressed in cases of cholera infantum. The diseased action and the therapeutic force of the drug are opposed to each other. The arterial depression, the vascular engorgement, the serous effusion, and great prostration all arise from paresis of the vaso-motor system, and whatever will restore the functions of this system will cure the disease. Dr. Horatio C. Wood says (THERAPEUTIC GAZETTE, July 15, 1885), "It is notorious that in our northern cities the infant mortality rises most extraordinarily and most abruptly upon the occurrence of a very hot spell of weather, such mortality being due to the so-called entero-colitis, the symptoms of which may be summed up as high fever, dry tongue and mouth, rapid pulse and respiration, intense thirst and vomiting, purging of greenish watery fæcal or serous matters with undigested particles of food, and more or less apparent evidences of cerebral disturbance, such as insomnia, headache, contracted pupils, delirium, and finally coma. In some of these cases the bodily temperature rises to a point almost reaching the maximum attained in the sunstroke of adults, and we well remember how we used to be taught to explain to the mothers under these circumstances that the disease had gone to the child's head

and was hopeless. They are in reality forms of thermic fever, the intestinal condition being no more a primary condition than is the coma of adult sunstroke a primary condition; if this fact were clearly recognized by our practitioners of medicine the mortality rate in our large cities among children in hot spells would be enormously reduced." "These cases," he continues, "are to be relieved not by calomel or astringents, or any other drug which relieves inflammation of the intestines, but by external use of cold water." Dr. Wood has been a strong advocate of this practice, and I have no doubt he has saved lives where without it death would have supervened. But we have spoken only of belladonna. Aconite holds a rank in no degree inferior to belladonna. In the first stages of cholera infantum it is especially valuable. When the pyrexia is high, the evacuations frequent, and the distress very marked, aconite will afford very prompt and effectual relief. Great caution is essential that too much is not given, else its therapeutic power will be lost in its toxic action. At first sight it may appear a gratuitous assumption to many that aconite should exercise any influence over this disease; but when it is remembered that aconite has a decided influence over the vaso-motor system, producing free diaphoresis, and stimulating the cardiac inhibitory nerves, it is obvious that it meets the indications for treatment. Hydrocyanic acid, by reason of its stimulating action upon the vaso-motor centres, is also valuable in these cases of undoubted paresis of the sympathetic. Dr. W. M. Ewing, of this city, informs me that he derives excellent results from the administration of ergotine in these forms of disorder, and in the limited number of cases in which I have tried it the result has not been disappointing. From its well-known physiological action, it would be indicated in these disorders.

I come now to speak of a remedy which I believe to be new in the treatment of cholera infantum, and one, too, which, from clinical experience, I feel assured will take a high rank as a potent agent for the relief and cure of this distressing affection. I apprehend the average reader will regard this a purely novel rather than a really practical suggestion, but I have no hesitation in saying that with me cocaine has established its claim to a place by the side of any remedy which the therapeutist may have recourse to. I was induced to try this remedy more than a year and a half ago in the case of my own child. The symptoms which characterized the case were profuse intestinal evacuations and vomiting, with great weakness, pallor of the skin, sinking of the eyes, coolness of the cheeks, hands, and feet, increasing frequency of pulse, and slight cyanosis of the face. I administered the sixth of a grain of the salt of the hydrochlorate every two hours with the best conceivable results. Since then I have frequently employed it with equally good results in similar cases. Perhaps I am unreasonably wedded to the remedy, but when I say that during two summers of long-continued extreme temperature I have not failed to cure every case of cholera infantum, I have reason for confidence. Grave a disease as is cholera infantum, its great mortality has been possible only because science had not indicated its rational, scientific treatment. We have in cocaine an agent which meets a double indication; it is a stimulant to the ganglionic centres, and at the same time a sedative to the sensitive gastro-intestinal mucous membrane.

In the THERAPEUTIC GAZETTE for July, 1886, Dr. J. H. Musser says, "A very successful run of cases of cholera infantum treated by the very frequent use of Dover's powder and calomel in small doses, dry on the tongue, has made the writer rely chiefly on these drugs." Who has not tried Dover's powder and calomel in small doses dry on the tongue? Who feels that when *this is done* the resources of science are exhausted? It is because this practice is disappointing and unsuccessful that the writer has abandoned it for a practice founded upon science, and as far removed from empiricism as medical practice can be. Dr. John Tilt says, "Vital acts are never found cut and squared with mathematical precision," but the medicine of the future must diligently seek to eliminate every element of uncertainty, and we will have established an art whose foundation rests upon a science as comprehensive as nature.

HYOSCINE HYDROBROMATE AS A HYPNOTIC IN PRIVATE PRACTICE.

BY FRANCIS L. AND JOHN R. HAYNES, M.D.,
PHILADELPHIA, PA.

"Facts, sir, facts!"—GADGRIND.

THIS paper is based on the administration of 338 doses of hyoscine to fifty-seven persons.

In some instances little or no effect was noticed after hyoscine, but generally one or more of the following symptoms occurred:

1. Delirium, rambling or muttering, with hallucinations of vision, resulting in attempts to grasp imaginary objects. Otherwise, it was not attended by marked muscular movement, the patient being generally contented to lie in bed.

2. Sleep, sometimes apparently natural, sometimes disturbed.

3. Intense reddening of whole face, with sensations of heat affecting the entire body.

It was not determined whether the temperature was actually elevated in such cases. Following the analogy of belladonna-poisoning, where we have noted a temperature as high as 103°, it seems probable that hyoscine-poisoning *of this type* is also associated with fever. But belladonna-poisoning is associated with dryness of the skin, while hyoscine does not check perspiration, though we have not noticed that it increases the activity of the sweat-glands.

Pallor of the face was seen much more frequently than flushing.

4. Muscular weakness, sometimes extreme.

5. Headache, sometimes affecting the entire cranium, sometimes frontal, and sometimes confined to region of inter-parietal suture.

6. Dryness of the throat and mouth.

7. Dilatation of pupil, with blurred vision.

The most remarkable variation was noted in the symptoms in different individuals, and, sometimes, in the same individual. This variation was but little influenced by the size of the dose. Thus we administered, personally, on the same day, under very similar circumstances, equal doses to two women (Cases 14 and 28): one was poisoned, the other fell into a pleasant sleep. In Case 26, gr. $\frac{1}{100}$ was followed by sleep, while gr. $\frac{1}{75}$ produced delirium; in Case 17, gr. $\frac{1}{100}$ produced delirium, and gr. $\frac{1}{80}$ was followed by sleep.

We have divided our cases, roughly, into the following classes:

1. Hyoscine produced sleep, fifteen cases.

2. It produced delirium, thirteen cases.

3. It was without marked effect, or was followed by various symptoms, twenty-nine cases.

As the result of our experience, we feel constrained to state that we consider hyoscine extremely unreliable as a hypnotic, and that it should not be used in general practice, except in cases in which other hypnotics have failed.

In the few instances where the alkaloid was used for other purposes, the results were not decisive. In one case of asthma (29) it did good; in another (52) it aggravated the patient's sufferings. Used to overcome the untoward effects of morphine in one case (10) it acted charmingly; in another (42) the results first noted were nullified by subsequent experience; and in a third (11) the combined bad effects of both drugs were shown.

Merck's hyoscine was used, except in a few instances, when that of M. L. C. Marquart was given (Cases 13, 15, 16, 46, 47, 54, 55, 56, and 57). Generally we administered the drug personally, and, in all cases, the greatest care was taken both in dosage and in the report of the effects. During cool weather, a solution containing ten per cent. of alcohol was well preserved; but, in summer, in order to prevent confervoid growths, the alkaloid was dissolved in pure alcohol (gr. $\frac{1}{100}$ to ♏xx).

I. HYOSCINE PRODUCED SLEEP.

1. Female, aged 19, marked insomnia from profound anæmia.

Hyoscine, gr. $\frac{1}{100}$, at bedtime gave seven hours' refreshing sleep. This was repeated sixteen times, at intervals, with similar effects, to the great benefit of the patient.

2. Female, aged 19, last stage of phthisis.

Hyoscine, gr. $\frac{1}{200}$, in daytime, produced sleep for one and one-half hours; gr. $\frac{1}{100}$, three and one-half hours. Repeated twelve times, with similar effects.

3. Female, aged 60, insomnia from old age, bronchitis.

Hyoscine, gr. $\frac{1}{100}$, at 7 P.M. Fell asleep at 7.30, and slept most of night; gr. $\frac{1}{200}$, next day, produced sleep for an hour. Repeated ten times, with similar results. She thought the drug relieved her cough.

4. Male, aged 45, gastric catarrh and severe headache, produced by drink.

Hyoscine, gr. $\frac{1}{50}$, at 7.30 P.M. Fell asleep at twelve, and awoke at six; well.

5. Male, aged 52, delirium from drink; almost sleepless for a week; hallucinations of vision, hiccough, vomiting.

First night.—Hyoscine, gr. $\frac{1}{75}$, in divided doses, was given between 3 P.M. and 12 M. next day. During this time, he slept two hours, or about as long as during the previous night. Stomach was settled, and his general condition was greatly improved, as the result of abstinence.

Second night.—Hyoscine, gr. $\frac{1}{75}$, in four doses. Slept six and one-half hours, and awoke free from hiccough.

Third night.—Slept about one-half as long as second night, without hyoscine.

Fourth night.—Hyoscine, gr. $\frac{1}{100}$. Slept eight hours.

6. Female, aged 35, confined to bed by miscarriage.

Hyoscine, gr. $\frac{1}{100}$, at 10 A.M. Drowsy all day; slept an hour in the afternoon.

7. Female, insomnia, acute pneumonia.

Hyoscine, gr. $\frac{1}{100}$, at 8 P.M. Fell asleep in fifteen minutes, and slept six hours.

8. Female, aged 35, pharyngitis, causing fever, severe headache, and sleeplessness.

Morph., gr. ii, in three doses, by suppository, given during the night, failed to produce sleep or any amelioration of suffering. Hyoscine, gr. $\frac{1}{75}$, in four doses during next day. Slept very well during most of day and succeeding night.

On second day.—Took gr. $\frac{1}{50}$. Fell asleep in an hour, and slept an hour.

9. Female, aged 25, debility after cholera morbus.

Hyoscine, gr. $\frac{1}{100}$, in eight doses, during day. Slept almost continuously after first dose.

10. Female, aged 55, intestinal colic. In morning she took morphine, relieving pain, but causing (as it always does in her case) severe nausea, vomiting, and insomnia.

To relieve these symptoms, ordered at 9 P.M. hyoscine, gr. $\frac{1}{100}$, in two doses. Immediate relief; slept all night; well in morning. (Compare with Case 11.)

11. Female, aged 25, bronchitis.

Hyoscine, gr. $\frac{1}{70}$, with morph., gr. i, in ten doses, in twenty-four hours. Dozed, but did not sleep; severe nausea; hallucinations of vision.

12. Male, aged 17, convalescing from typhoid.

Hyoscine was given at intervals of several days, always in the morning. After gr. $\frac{1}{200}$, did not sleep as much as usual. After gr. $\frac{1}{100}$, slept three hours more than usual. After gr. $\frac{1}{75}$, did not sleep. After gr. $\frac{1}{50}$ on three occasions, and gr. $\frac{1}{37}$ on one occasion, he slept one and a half hours more than usual. Hyoscine did not modify the profuse sweating, which was one of this patient's symptoms. Twice flushing of the face and dilatation of pupils occurred, once headache, but never any throat dryness.

13. Female, aged 25, insomnia following intermittent.

First and second nights.—Did not sleep.

Third night.—Hyoscine, gr. $\frac{1}{100}$, was given at 8 P.M, when she felt no inclination to sleep. Fell asleep at 8.30, and awoke at twelve. At 12.30 received hyoscine, gr. $\frac{1}{150}$. Fell asleep at one and awoke at five.

Fourth night.—Hyoscine, gr. $\frac{1}{150}$, at nine o'clock. Fell asleep at ten and awoke at six next morning.

14. Female, aged 40, eighth day puerperium.

Hyoscine, gr. $\frac{1}{200}$, at 1 P.M. The only effect was a pleasant sleep, commencing in fifteen minutes and lasting for three hours, when she was awakened by callers. (Refer to Case 28.)

15. Female, aged 28, phthisis, had recently recovered from severe whiskey-gastritis. Had not had good night's rest for two weeks.

Hyoscine, gr. $\frac{1}{100}$, at 10.30 P.M. Fell asleep at eleven, awoke at three for a few minutes; then slept till five. Vomited. Fell asleep again at 5.30 A.M., and slept until eleven. Felt wretched and vomited freely all day. Refused any more of "that poison."

16. Female, aged 20, insomnia, typhoid.

Hyoscine, gr. $\frac{1}{80}$, in two doses at night, was followed by about three hours' sleep. No ill effects. Had not rested so well for several nights.

II. HYOSCINE CAUSES DELIRIUM.

17. Female, aged 15, acute catarrhal pneumonia; insomnia produced by cough and fever; mind clear.

First night.—Hyoscine, gr. $\frac{1}{150}$, repeated in three hours. Slight delirium all night.

Second night.—Hyoscine, gr. $\frac{1}{100}$, at nine; delirium for four hours; then slept until morning.

Third night.—Hyoscine, gr. $\frac{1}{100}$, with same effect.

Fourth night.—Hyoscine, gr. $\frac{1}{80}$, at eight. Slept from 11 P.M. to 1 A.M. From one to two remained awake, drinking constantly, then fell asleep, and awoke at 5 A.M. No delirium from this dose.

Fifth night.—Hyoscine, gr. $\frac{1}{80}$, combined with morph., gr. $\frac{1}{12}$, at seven. Fell asleep immediately, and slept till 5 A.M.

Sixth night.—Slept fairly well, without hypnotic.

18. Boy, aged 9, restlessness due to gastric catarrh.

Hyoscine, gr. $\frac{1}{17}$, in five doses, in six hours. No sleep. After second dose, he began to talk incessantly and irrationally, and to clutch at imaginary objects; he was excited in manner. When placed on his feet, he attempted to walk, but staggered, and would have fallen, if he had not been supported. Redness of face, and dilatation of pupils. Symptoms resembled mild belladonna-poisoning, such as we have frequently seen in children, treated for whooping-cough, by large doses of that drug.

Paregoric, ʒvi, was given in divided doses, but he remained delirious and sleepless for seventeen hours.

19. Male, aged 40, last stage acute tuberculosis.

Hyoscine, gr. $\frac{1}{200}$, every eight hours, until gr. $\frac{1}{25}$ was used; produced no sleep, but very mild, rambling delirium. Then same dose was repeated every two hours, until $\frac{3}{100}$ additional was used. The delirium became more marked, and lasted until eight hours after the last dose, but did not seem unpleasant either to patient or nurse. Morph., gr. $\frac{1}{4}$, had no effect on the delirium.

The same patient took from gr. $\frac{1}{4}$ to $\frac{3}{8}$ of morph. every night for four nights, with the effect of producing pleasant sleep, lasting all night.

20. Female, aged 65, habitual insomnia of old age. Laudanum in large doses produced pleasant sleep; its use had become habitual at one time, but two months before taking hyoscine she had discontinued it.

Hyoscine, gr. $\frac{4}{75}$, in sixteen doses, in two nights, produced no sleep, but mild delirium. On the *third night* slept somewhat without hypnotic.

21. Male, aged 66, cerebral paralysis, insomnia, delirium.

Hyoscine, gr. $\frac{1}{20}$, in four doses, in two nights, had no effect except to make him more delirious.

Morph., gr. $\frac{1}{4}$, with hyoscine, gr. $\frac{1}{30}$, in two doses, made him sleep well, and repetition of such doses served a good purpose until his death.

22. Female, aged 60, bronchitis, insomnia.

Hyoscine, gr. $\frac{3}{100}$, in two doses. No sleep. Delirious all night.

Chloral, gr. xl, in two doses, was given the succeeding night, and, after five hours, produced profound sleep lasting eight hours.

23. Male, insomnia, chronic bronchitis.

Hyoscine, gr. $\frac{1}{80}$, at night, in two doses. No sleep. Slight delirium.

The chloral-bromide-morphine mixture, in moderate doses, produced sleep.

24. Male, acute pneumonia, sleeplessness.

Hyoscine, gr. $\frac{7}{100}$, in seven doses, in twenty-four hours. After first dose he became delirious (hallucinations of vision, rambling talk, kicking and pulling at bedclothes and imaginary objects), and remained so for thirty-six hours. At the twenty-fourth hour, he was ordered morph., gr. $\frac{1}{8}$, and in eight hours (after taking gr. i) fell asleep.

After this morphine, in moderate doses, acted well as a hypnotic.

25. Male, aged 7, cerebro-spinal meningitis (headache, fever, violent delirium, jactitation, absolute sleeplessness, opisthotonos, dilated pupils).

Hyoscine, gr. $\frac{1}{200}$, every three hours, until $\frac{1}{75}$ was taken. Then $\frac{1}{100}$, every three hours, till $\frac{1}{50}$ was taken. No change, except that delirium seemed more marked. Then paregoric, ʒss, every two hours, until ʒi was taken. No improvement.

Then moderate doses of chloral, bromide, and morph. produced sleep, and this mixture was used with great satisfaction, for this purpose, until he recovered (about ten days).

26. Female, aged 30, insomnia, acute rheumatism.

After hyoscine, gr. $\frac{1}{100}$, at 8 P.M., slept two and a quarter hours.

Two days after took gr. $\frac{1}{100}$ at 8 A.M., and slept one hour. Three days after, gr. $\frac{1}{75}$, at 9.25 P.M., produced slight delirium, lasting all night. Three days after, gr. $\frac{1}{75}$ at 11.30 P.M. Delirium until 3 A.M., then sleep until 5 A.M.

27. Female, aged 25, insomnia, due to nervousness and anæmia.

Hyoscine, gr. $\frac{1}{80}$, in divided doses, every night for three nights. During this time she did not sleep, but talked constantly, not allowing her room-mate to sleep. I could not determine that she was irrational. She felt so bright after taking each dose that she accused me of giving her a stimulant.

28. Female, aged 30, eighth day of puerperium.

Hyoscine, gr. $\frac{1}{100}$, at 1 P.M. In half an hour, dimness of vision, headache, intense burning sensation of skin, extreme sense of weakness. Then constant, unintelligible muttering. Symptoms had nearly passed away by 6 P.M., and at ten she fell asleep.

29. Female, aged 58, asthma and bronchitis, insomnia.

Hyoscine, gr. $\frac{1}{50}$, at 11 A.M. Slept four and a half hours; then mild delirium for eight hours. Cough and dyspnœa much improved. As she had failed to procure any relief from her previous treatment (pot. iod., with small and frequently-repeated doses of morphine), she was now directed to take hyoscine, gr. $\frac{1}{100}$, every two or three hours. This was so effectual that she was discharged in four days.

III. HYOSCINE PRODUCED NEITHER SLEEP NOR DELIRIUM; BUT EITHER HAD NO EFFECT, OR WAS FOLLOWED BY VARIOUS SYMPTOMS.

30. Female, aged 24, insomnia, neurasthenia.

Hyoscine, gr. $\frac{1}{200}$, every night for three nights; then gr. $\frac{1}{100}$ every night for three nights. Sleep more restless than usual; slept better after drug was discontinued. The eyesight was much impaired.

31. Female, aged 40, sleeplessness from bronchitis.

Hyoscine, gr. $\frac{1}{100}$, every night for eight nights caused restlessness. Slept much better without it.

Morphine in decided doses produced sleep.

32. Male, aged 48.

Hyoscine, gr. $\frac{1}{100}$, at 6 P.M. Remained awake and restless all night.

33. Male, aged 20, insomnia, delirium, typhoid fever.

Hyoscine, gr. $\frac{1}{50}$, had no effect whatever.

Morphine, in decided doses, produced sleep.

34. Male, aged 35, insomnia from excessive mental exertion.

Hyoscine, gr. $\frac{1}{100}$, at night, no effect; gr. $\frac{1}{50}$, at night, was followed by sleep after one and a half hours, but he was disturbed by dryness of the mouth and throat, and considered that he rested much better without it.

Pot. brom., ʒii, generally gave this patient a good night's rest, while chloral, ʒss, produced ten hours of profound sleep.

35. Female, aged 35, perimetritis.

Hyoscine, gr. $\frac{1}{100}$, at 10 A.M. No effect.

36. Female, aged 50, dacrocystitis.

Hyoscine, gr. $\frac{1}{100}$, at 10 A.M. No effect.

Second day.—Hyoscine, gr. $\frac{1}{80}$, at 12 M. For three hours felt dizzy and "drunk;" was very talkative; throat extremely dry; eyesight very dim. She was forced to lie down through great muscular weakness, but did not sleep for thirty hours.

Eighth day.—Hyoscine, gr. $\frac{1}{75}$, at 3 P.M. Effects the same, except that she slept after eight hours.

37. Adult, insomnia, typhoid fever.

Hyoscine, gr. $\frac{1}{80}$, at night for two nights. No effect.

38. Adult, insomnia, typhoid fever.

Hyoscine, gr. $\frac{1}{100}$, at night. No effect.

39. Adult, insomnia, delirium tremens.

Hyoscine, gr. $\frac{1}{100}$, at night. No effect.

40. Adult, insomnia.

Hyoscine, gr. $\frac{1}{100}$, at night. No effect.

41. Female, aged 30, puerpera.

Hyoscine, gr. $\frac{1}{100}$, at 11 A.M. No effect except to flush face.

Next day gr. $\frac{1}{50}$ at 10 A.M. She did not think that she slept any more than usual.

42. Female, constant pain from sarcoma uteri.

Hyoscine, gr. $\frac{1}{100}$, was taken at sixteen different times day and night. She said, "It made me helpless; I could not speak or sleep, and felt as if I were sinking all the time."

Morphine stupefies this patient; causes her to doze but not to sleep, and produces cramp-like pains in the stomach and vomiting.

Morph., gr. $\frac{1}{4}$, with hyoscine, gr. $\frac{1}{100}$, produces the same effect as morphine alone, *except that no cramp or vomiting occurs.*

After the above experiments morphine alone was used daily to relieve pain, and it became evident that toleration had become established. No stomach symptoms were now felt, nor was the sensation of helplessness as great as when hyoscine also was used.

43. Female, aged 36, healthy.

Hyoscine, gr. $\frac{1}{100}$, at 3 P.M. had a somewhat exhilarating effect.

After ten days, gr. $\frac{1}{50}$ was given at 7 A.M. Headache, marked muscular weakness, no sleep, but slight drowsiness.

After ten days, last experiment repeated with same result. The body temperature was taken every hour; it remained normal.

44. Female, aged 25, hydrosalpinx.

Hyoscine, gr. $\frac{1}{50}$, was given on two occasions during daytime. Did not sleep during day, and not as well as usual on succeeding night; weakness, etc.

45. Male, aged 63, wild delirium from acute nephritis.

Hyoscine, gr. $\frac{1}{100}$, was given at six different times.

Twice it was succeeded by a few hours' sleep. Four times it was without effect.

46. Male, aged 71, wild delirium, fracture neck of femur.

First night.—No sleep, although chloral, ℈ii, was given in two doses.

Second night.—Hyoscine, gr. $\frac{1}{100}$, was followed by eight hours' interrupted sleep.

Third night.—Hyoscine, gr. $\frac{1}{100}$. Wild delirium all night.

Next morning at 11.30 hyoscine, gr. $\frac{1}{100}$; fell asleep at twelve and awoke very delirious at one.

After this chloral-bromide-morphine mixture, in large doses, produced sleep whenever a hypnotic was required.

47. Female, aged 18, insomnia from excessive study.

Hyoscine, gr. $\frac{1}{100}$, at 10.30. Fell asleep at twelve. "Frightened" sleep during remainder of night; awoke with severe headache, and declared emphatically that she "would take no more of that stuff."

48. Male, aged 14, healthy.

Hyoscine, gr. $\frac{1}{133}$, at 2 P.M. He was carefully watched by one of the writers, but no effect whatever was noticed.

One month after, he received gr. $\frac{1}{100}$ at 1 P.M., and in five hours gr. $\frac{1}{300}$. No effect.

49. Female, aged 35, dyspepsia.

Hyoscine, gr. $\frac{1}{66}$, at 2 P.M. Severe headache and throat-dryness, with general malaise. Fell asleep at 10 P.M.

50. Female, aged 17.

Immediately after removal of tonsil received hyoscine, gr. $\frac{1}{100}$, at 2.30 P.M. In twenty minutes face became very red, and she felt very sleepy and miserable. At 10 P.M. fell asleep, but sleep was much disturbed throughout night.

51. Female, aged 22, third day puerperium.

Hyoscine, gr. $\frac{1}{133}$, at 11 A.M. Severe headache, redness of face, "burning" feelings, throat-dryness, thirst. Fell asleep twice, but was awakened in a few minutes by terrible dreams. Sweated profusely, as the temperature of the room was 98°.

52. Male, aged 29, mild asthma, troublesome cough, whistling rales.

July 30, 9 A.M.—Hyoscine, gr. $\frac{1}{300}$, every two hours. 7 P.M., has taken four doses; mouth and throat *feel* dry.

July 31, 9 A.M.—Slept but three-quarters of an hour last night, principally on account of dryness of throat. 7 P.M., slept about one and a half hours during day; slight frontal headache; pupils dilated; vision very indistinct.

August 1, 2 P.M.—The last dose was taken at 10 A.M., making gr. $\frac{1}{10}$ in forty-eight hours. Slept three and three-quarters hours last night, making six hours in all since he commenced taking hyoscine. Now has very severe headache and extreme muscular weakness, besides symptoms mentioned above. The hyoscine symptoms passed away in about thirty-six hours more.

Although he complained constantly of throat-dryness, yet, on repeated examination, the mouth and pharynx presented a natural appearance.

53. Male, aged 25, indigestion.

Hyoscine, gr. $\frac{1}{300}$, at 2 P.M. Felt very drowsy, and went to bed, but could not sleep till 1 A.M. Headache, weakness, fever, redness of face, dilatation of pupils.

Hyoscine, gr. $\frac{1}{300}$, three days after, at 9 A.M. Staggering gait, but ***no headache or dryness of throat;*** anorexia. Symptoms had about disappeared by 4 P.M. (when he walked a mile), except dilatation of pupils, which was quite noticeable at the end of forty-eight hours. Fell into a sound sleep at 10 P.M.

54, 55, 56, and 57, adults, suffering from insomnia. Each received gr. $\frac{1}{100}$ at night, without effect. Refer also to Case 11.

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NOTE ON HYDROBROMATE OF HYOSCINE.

BY P. S. ROOT, M.D., MONROE, MICH.

THUS far in the therapeutic literature of the uses of hyoscine I have seen mentioned no untoward effects from the use of this drug in ordinary doses (such as recommended by alienists), ranging from $\frac{1}{120}$ to $\frac{1}{40}$ of a grain, administered hypodermically.

The following case illustrates the fact that even smaller doses than those indicated may occasion dangerous symptoms:

Mrs. ——, age 58, of full habit, the subject of "continued fever," had for a number of days suffered from persistent insomnia, not alleviated by ordinary remedies, temperature ranging from 101° to 103°; pulse, 116 to 120 and weak; further, the symptoms indicated marked functional derangement of the sympathetic nervous system. The insomnia proving intractable, and rest being a requisite, Dr. E. L. Shurly was called in consultation, and upon his recommendation, concurred in by myself, I administered $\frac{1}{800}$ of a grain of hyoscine *per os* at 11.30 A.M. At 12.30 P.M. I was hastily summoned, and found the following condition: Patient in deep stupor, from which she could not be roused; respiration extremely shallow and 50 per minute; pulse 96, full and strong; tongue and mouth dry; pupils widely dilated; countenance suffused and livid; convulsive movement of lower extremities, etc. Suitable stimulants were administered, the patient being only able to swallow after the fluids had reached the lower pharyngeal muscles; in fine, there was no power to swallow. This condition persisted for two hours, when she could be partially roused, after which she passed into a more tranquil slumber, sleeping for a number of hours, all effects of the drug passing off, but with mitigation of many of the nervous symptoms.

After this, on a partial recurrence of the symptoms, I administered $\frac{1}{1200}$ of a grain, which was followed by the dreamful sleep characteristic of the drug. The above case

is mentioned that the profession may not be too incautious in the administration of this powerful alkaloid. I may say that investigations were made as to the possibility of mistake in dispensing, but none was found to exist; and that I administered the same dose, hypodermically, to a case of acute mania, but without even getting the characteristic effect of the drug. In conversation with my friend, Dr. Geo. P. Andrews, of Detroit, he narrated to me a case in his own practice where similar symptoms resulted from the administration of $\frac{1}{400}$ of a grain. Finally, that hyoscine is a hypnotic of undoubted value is undeniable, but the promiscuous administration of it is not to be recommended, save with the utmost caution. From my experience, I would say that the usual dose should not be greater than $\frac{1}{400}$ of a grain, save in cases of acute mania.

THE USE OF AN ABDOMINAL BANDAGE IN THE SECOND STAGE OF LABOR, WITH A REPORT OF TEN CASES.

By J. Wesley Welker, M.D., Stromsburg, Neb.

UP to the commencement of the second stage of labor the uterus alone is concerned in dilating the neck, but it then seems to call in aid the contraction of the abdominal muscles, and consequently both the pain and the bearing down are carried to a much higher degree. The pains are stronger, yet nevertheless the woman assists them by voluntarily contracting the abdominal muscles; and as the pains grow stronger and labor seems to be tedious, then the woman will often call on her physician for help. I believe that this assistance can be rendered by the use of an abdominal bandage, and that by it, in the second stage of labor, we may not only lessen the suffering of our patient, but at the same time shorten the duration of labor. Consequently I use the abdominal bandage for a twofold purpose: First, to lessen the suffering of my patient. To accomplish this I apply it at or before the commencement of the second stage of labor, making it just tight enough to be comfortable to my patient. Second, to shorten the duration of labor. To accomplish this end I tighten the bandage when the abdominal muscles are called upon to assist the uterus in expelling its contents. In my first cases I used simply an ordinary linen towel, which I put around the abdomen of the woman and secured with pins, which I unpinned and tightened as the case demanded. I now use a bandage which I constructed for that purpose, which resembles in shape the lower half of a corset, except I have it open on the side, making a back and abdominal piece, which I unite by means of straps and buckles. Having it open on both sides I can adjust it more easily to fit different-sized patients. The following cases illustrate some of my results:

Case I.—Primipara, had been in labor for thirty-six hours, os rigid, and not dilated larger than a silver dollar, and membranes protruding. I applied the abdominal bandage and ruptured the membranes, and the child was delivered in about thirty minutes. The placenta came away in about fifteen minutes.

Case II.—Primipara, had been in labor when I arrived about twelve hours, and the membranes had been ruptured for about two hours. I at once applied my abdominal bandage, and labor was completed in twenty minutes.

Case III.—Multipara, mother of three children. In a violent pain, just as I entered the room, the membranes were ruptured. I at once applied my abdominal bandage, and labor was complete in fifteen minutes.

Case IV.—Primipara, had been in labor about two hours when I arrived; membranes were ruptured. I applied my bandage, and labor was complete in twenty minutes.

Case V.—Had been in labor for six hours; membranes ruptured about fifteen minutes before I arrived. I at once applied my bandage, and labor was completed in fifteen minutes.

Case VI.—Primipara, had been in labor for ten hours, and membranes ruptured about two hours before I arrived. I at once applied my abdominal bandage, and labor was completed in eighteen minutes.

Case VII.—Multipara, mother of six children, had been in labor about four hours; the membranes ruptured a few minutes before I arrived. I applied my abdominal bandage, and in eight minutes labor was completed. In her six other confinements the times from the rupturing of the membranes to the completion of labor were not less than six hours.

Case VIII.—Primipara, had been in labor four hours when membranes ruptured. I applied my abdominal bandage, and labor was completed in twenty-eight minutes.

Case IX.—Multipara, mother of four chil-

dren. I applied my abdominal bandage before the completion of the first stage of labor, in order to relieve an annoying pain in the small of the back. Therefore I did not make my bandage as tight as I do in the second stage of labor. In forty-five minutes the membranes ruptured, and I tightened the bandage, and labor was completed in ten minutes.

CASE X.—Primipara, had been in labor but one and a half hours when I applied my abdominal bandage. The membranes ruptured immediately after I applied the bandage, and labor was completed in twenty-five minutes.

Now, in conclusion, let me repeat the benefits that may be derived by the use of an abdominal bandage during labor. By applying it during the first stage of labor we do away with the restlessness so peculiar to the first stage. Last, but not least, we shorten the duration of the second stage of labor, and by so doing we deliver the woman before she has worn herself out by contracting the muscles of the chest to stimulate the abdominal muscles to help the uterus expel its contents.

ON LOBELIA INFLATA IN ASTHMA.

The employment of lobelia inflata against asthmatic disorders has of late become obsolete, owing to the alleged inertness of the drug in the mentioned affection. DR. NUNES writes to the *Bulletin Génèr. de Thèr.*, No. 4, 1886, that he feels convinced that the failure of lobelia in asthma is caused solely by using the drug in too small doses. Trousseau and Pidoux prescribed 2 to 25 drops of the tincture three to four times daily, Dujardin-Beaumetz 20 to 50 drops, Gubler 1 to 2 f℥, and Torres Ilomen even 2½ f℥ with very satisfactory results. No other clinician has ever employed the drug in so large a dose as Ilomen for fear of causing untoward symptoms or even poisoning. Nunes's practice of exhibiting the tincture of lobelia in doses of ½ to 1 f℥, without having ever met with an accident, shows how little the above-mentioned fears are justified. In order to intensify the expectorant action of lobelia, Nunes combines it with benzoate of ammonia. His results were very encouraging. The following cases are alluded to in Nunes's communication:

A man of 56 years of age was suffering for a year from strong dyspnœa and coughing, interfering with his sleep. On auscultation whistling and bellows-sounds were heard. Heart and blood-vessels were normal. Nunes prescribed

℞ Tinct. lobeliæ, f℥iv;
Ammon. benz., ℥iiss;
Aquæ dest., f℥vii. M.
S.—A tablespoonful every two hours.

Later the quantity of lobelia was doubled; the patient recovered completely.

A man 24 years of age suffered for three years from dyspnœa and cough. The vascular system was normal, but the liver was enlarged. The latter condition was removed by giving the patient

℞ Calomel, gr. viii;
Pulv. rad. rhei,
Sacchar., āā gr. vii.
S.—Take before retiring.

Later the following was prescribed:

℞ Tinct. lobeliæ, f℥v;
Ammon. benz., ℥iii;
Aquæ dest., f℥vii. M.
S.—Tablespoonful every two hours.

After three days, cough and dyspnœa had decreased. Nunes then ordered:

℞ Terpine, gtt. 15;
Mixt. gumm., f℥vii.
S.—Tablespoonful hourly.

As the condition of the patient grew worse, Nunes resorted to the dose of 1 f℥ of lobelia in 7 f℥ of water, as given to the first patient, whereupon the patient recovered.

In two other cases, Nunes obtained the same favorable results by equally large doses of the tincture of lobelia.

ON CERTAIN APPEARANCES IN THE URINE AFTER THE USE OF NAPHTHALINE.

In the *Arch. f. Experim. Pathol.*, vol. xxi., part i. p. 34, 1886, PROF. PENZOLDT publishes a peculiar reaction of naphthaline in the urine, which he describes as follows: Pour a small quantity of the urine, which is to be examined, into a test-tube, and add 1 c.c. of concentrated sulphuric acid. The urine swimming above assumes at once a green coloration, which is especially clear and beautiful at the line of contact of both liquids. Gradually the green color becomes turbid, and ultimately disappears. This reaction sets in invariably after the use of naphthaline, and probably refers to the formation of β-naphthachinon.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
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Leading Articles.

CALOMEL IN THE TREATMENT OF CARDIAC DROPSY.

THE striking results of Jendrássik as to the diuretic action of calomel in the treatment of dropsy, especially of cardiac origin, have already received confirmation. In the *Wierner Med. Wochen.* (July 10, 1886) Prof. Stiller, of Buda-Pest, publishes the details of eighteen cases of dropsy of cardiac origin which he has treated both in hospital and in private practice by the administration of calomel after the directions given by Jendrássik. His results, although he but seldom obtained the immense increase of urinary secretion reported by Jendrássik, were in their general results quite equally favorable to his. Two cases he gives in full detail, and either alone would be sufficient to prove the truth of the statement that in calomel a drug has been found whose value seems in such cases almost inestimable. Cases with intense œdema of the extremities, peritoneal and pleural effusions, enlarged and congested liver with marked dyspnœa, he has succeeded in restoring almost to health, certainly to comfort, by the administration of calomel. He has seen œdema entirely disappear, abdominal and pleural effusions and albuminuria removed, an enlarged liver return to its normal size with complete relief of respiratory distress. Such results have followed the administration of calomel alone after digitalis had failed to produce relief, and also in cases where the use of digitalis, on account of the unfavorable symptoms which so frequently interfere with its action, had compelled its suspension. Dr. Stiller thinks that he is perfectly warranted in confirming in all respects the statements of Jendrássik. He believes that in dropsy of cardiac origin small doses of calomel constitute the most efficient and rapid means of relief even in cases where digitalis fails, while no other drug can in any degree sufficiently approach it to be worthy of being brought into the same category. Its action is not only exerted on the removal of the œdema, but also on the effusion of serous cavities.

The diuresis, agreeing again with Jendrássik, he found to suddenly occur on the third or fourth day after the commencement of the administration of the drug, and it is advisable to suspend its use, to be renewed again in considerably decreased doses when the diuretic action appears to be disappearing. This action in the removal of effused liquid is only to be explained by some particular facilitation of absorption by the blood, since Stiller as well as Jendrássik found that calomel so administered was entirely without influence on the heart or kidneys. In his first few cases Dr. Stiller found that diarrhœa, and in one case stomatitis, complicated his results, but in his later experience he found that the administration of opium with the calomel entirely prevented the appearance of diarrhœa, while it did not interfere with its diuretic action. According to his experience, the most marked diuretic effects have been produced from calomel without the least sign of mercurialization.

In spite of these favorable reports, calomel cannot, however, be regarded as a substitute for digitalis, since it is in no respect a heart remedy. In the numerous cases where digitalis fails or is contraindicated, and where numerous substitutes for digitalis are either not applicable or have proved themselves unreliable, according to the above authors the value of calomel cannot be overestimated. Enough has already been determined by those two authors to prove that calomel in such diseases must in future occupy a very important place. As to the more exact indications as to its use, cases in which it is most favorable

and as to whether its employment exerts any influence on the further progress of the cardiac disease, these facts must, of course, be left to future investigations. It is to be hoped that in the treatment of heart-disease calomel will receive the investigation which it without doubt seems to deserve.

THE COMBINATIONS OF DRUGS.

ATTENTION is drawn in an address recently delivered by Prof. Goll before the Swiss Medical Association (*Correspondenzblatt für Schweiz. Aerzte*, No. 14, 1886) to a point in the practical administration of drugs which seems hardly to have attracted the attention which it merits. The days of bulky polypharmacy have passed, and we are now more and more striving for the isolation of active principles and the administration of drugs in concentrated, isolated forms, but yet a careful study of many of the old prescriptions can teach us many points of value. The value of many combinations of drugs is well known. Many have fallen out of use, and many new combinations may serve totally to modify the character of the individual ingredients, or, better yet, to prevent the unfavorable actions of certain drugs while accentuating the influence which it is desired that they exert. Dr. Goll calls attention to several of these which are well worthy of notice, even although many of them may be known, and although constantly employed.

First, as regards the use of opium. As is well known, opium is often added to numerous medicines to render them less irritating to the stomach or intestine, or to reduce or prevent some remote reflex action. Thus vomiting produced by irritant action on the stomach is often entirely prevented by the use of opium. Oppholzer and Hasse long ago called attention to the fact that the emetic action of antimony, while not hindered by the conjoint administration of opium, was freed from the painful retching and cramps of the abdominal muscles which almost invariably follow its administration alone. So again in the administration of drugs which are absorbed but with difficulty, the conjoint use of opium, by delaying the passage of the drug through the alimentary canal, assists in its more complete entrance into the circulation. Thus salivation or the constitutional action of mercury is more readily produced by the addition of a little opium to calomel or mercurial iodide. Finally, the addition of opium to cough mixtures as a means of dulling the irritation from the bronchial tubes, reducing expectoration and relieving dyspnœa, is well known and every day employed.

Equally important are the various purposes served by the combination of belladonna and atropine with other remedies. Thus from the time of Trousseau atropine or belladonna has been combined with opium as a palliative against the night-sweats, cough, and dyspnœa of phthisis, while again it does not seem to be appreciated that the vomiting and nausea which in so many cases follow the subcutaneous use of morphine may be almost entirely, if not invariably, removed by the combination of one part of atropine with fifteen to ten of the morphine in the subcutaneous injection. Where morphine must be given continuously nausea and vomiting may be permanently removed by the combination of atropine in the first few injections which are given. The system seems then to tolerate the morphine, and the atropine may be omitted. So also in the removal or the prevention of nasal catarrh so constantly produced by the administration of iodide of potassium. Here the primary combination of the belladonna with the potassium iodide not only assists in the absorption and more rapid production of iodism than when the iodide of potassium is alone given, but will constantly prevent the production of the nasal complication. Against salivation Dr. Goll finds that belladonna is less active, but that there is no other drug which is equally efficacious in suppressing profuse perspiration.

One of the oldest uses of belladonna is in the relief of cardialgia and intestinal colic, where belladonna or hyoscyamus extract is to be preferred to opium or morphine. The combination of belladonna or hyoscyamus with colocynth, senna, and other drastic purges, will almost entirely prevent the griping and colic which so often renders the use of these drugs so disagreeable. An old form of administration of the extract of the hyoscyamus with colocynth and aloes, or the more modern American formula of the combination of extract of belladonna with three times its weight of podophyllin with soap, is worthy of the reputation which it at present enjoys. It is well known that by means of belladonna the intestinal muscular fibres are first excited and then partially paralyzed; hence belladonna is a valuable remedy for the relief of the spastic colic which accompanies lead-poisoning.

Another use of belladonna which does

not seem to have attracted sufficient attention is in its administration as a cardiac stimulant. The following statement of Luchsinger deserves to be widely known: "If the heart is brought to a stand-still, whether by chloroform or potassium salts, by gallic or oxalic acid salts, by apomorphine, quinine, zinc, or poisonous mushrooms, atropine will always succeed in the commencement of the paralysis in restoring the action of the heart." Again, the combination of morphine and atropine in the proportion of twenty to one will accentuate the action of cocaine; combined with chloral, belladonna reduces the paralyzing action of the former on the heart, while, according to Bert, Morat, Aubert, Doster, and Laborde, preliminary injections of atropine will greatly remove the danger of arrest of the heart in chloroform narcosis. Finally, the combination of belladonna with quinine or salicylic acid has deserved the greatest reputation in the treatment of neuralgia.

Still another use of the combination of drugs is called attention to by Dr. Goll, where the production of solubility plays the most important rôle. Mercury, as is well known, is with difficulty absorbed, and is corrosive in many solutions. The combination of mercury with albumen forms one of the most absorbable compounds. Such a solution is easily prepared by warming a solution of one of the haloid salts of mercury in the presence of a soluble albuminate. Many other additions might be made to this list of useful combination of drugs, but enough has already been said to call attention to the useful purpose which may often be served by the judicious combination of drugs, and to teach us that we must not entirely neglect the teaching of the older therapeutists.

THERAPEUTIC INNOVATIONS IN DIPHTHERIA.

THERE are professional men who regard the search for specific, or, in fact, for any other remedies against the infectious fevers, as absolutely futile, because none can, in their estimation, ever be found. Others again claim that a fever not only *cannot* be cured, but also *ought not* to be cured, for they declare (as did Prof. Winternitz) fever is merely a bridge for the diseased organism to the recuperation of its prior state of health, and the high temperature itself removes the etiological factors of the disease, viz., the micro-organisms infesting the circulation. The question whether a fever can in reality be cured cannot engage our attention, as the rational school of medicine has never advanced any claims in this direction, and all of its remedial endeavors are directed solely against the sequelæ and complications of the febrile affection. The conviction of the impotency of our therapeutic resources against the infectious fevers ought, however, merely to enhance our appreciations of prophylactic measures without relaxing our efforts in the search for remedial means and ways.

In diphtheria especially it cannot be doubted that the results of treatment obtained at the present day surpass considerably those of the past, though this favorable showing is probably less to be credited to the exhibition of novel medicaments than to the more rational general treatment of the affection as the natural outcome of a better understanding of the nature and causes of infectious fevers. Still, there have been within the past year or two recorded certain therapeutic innovations in the treatment of diphtheria which, for their strikingly gratifying result, have attracted unusual attention. We beg to discuss here some of the novel procedures in the treatment of diphtheria.

Our readers will recall the simultaneous eulogy of the actual cautery in diphtheria by Dr. Bloebaum, of Koblenz, and an Italian physician, as published in the THERAPEUTIC GAZETTE in the first issues of this year. Bloebaum saved quite a number of grave cases of diphtheria by applying, in the initiatory phase of the affection, the Pacquelin cautery to the tonsils and fauces.* Prof. Henoch, of Berlin, also tried the cautery in an almost hopeless case of diphtheritic infection,† with the result of saving the patient. Henoch resorted to chloroform, which he declared as indispensable (a fact not mentioned by Bloebaum) for the accomplishment of a thorough cauterization. Of course it was understood that this treatment could only be successful in the beginning of the disease, when, as Francotte declares, diphtheria is a simple local affection.

Bloebaum has time and again exhibited the cauterization treatment in diphtheria, and met with success in every instance where success could possibly be anticipated.

In No. 37 of the *Deutsche Medizinal Zeitung*,

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* *Schmidt's Jahrbucher*, vol. 209, p. 49.

† As reported by our special correspondent at Berlin, who was at the time asked to assist.

1886, Dr. Bloebaum publishes an accurate description and cuts of the apparatus requisite for the galvano-caustic treatment of diphtheria. At the same time he records another series of diphtheritic cases successfully treated by his plan. We abstract from this paper the *résumé* of the clinical history of a diphtheritic infection occurring in his own daughter, aged sixteen years.

The girl was taken sick in the evening of the 3d of April, under the usual premonitory symptoms of diphtheria. On the following morning the right tonsil presented a diphtheritic ulcer of a considerable size, which was immediately cauterized. In the evening the girl had no fever. On the following morning the patient presented four circumscribed deposits on the left tonsil, each of the size of a lentil. Again cauterization was performed, and still no evening fever appeared. The girl slept well, and was wholly restored on the succeeding day.

We pass to another mode of treatment, which, without any claims to a specific character, appears to have led to very gratifying results. Prof. Hofmokl, of Vienna, following the recommendation of Vogelsang, tried the peroxide of hydrogen in a number of diphtheritic cases, and advocates this therapeutic agent warmly in the *Wiener Med. Presse*, 1886, xxvii. 18, 19. Hofmokl prescribes the drug to be taken internally, as follows:

℞ Hydrog. peroxide (2 per cent.), 200 parts.
Glycer. pur., 3.0 parts.
S.—One teaspoonful every two hours.

At the same time the drug is to be exhibited as an inhalation. It is very probable that the beneficial effect derived from the use of the peroxide of hydrogen refer to its decomposition in the system, and the subsequent introduction of free oxygen into the blood.

Another plan of treatment recently proposed by Noeldechen, of Pforta, in the *Deutsche Medizinal Zeitung*, No. 33–36, 1886, is likewise worthy of attention. This author recommends a carefully-executed brushing of the tonsils or fauces with salicylic acid in substance. No doubt the antiparasitic virtues of salicylic acid exhibited when the diphtheritic infection is still local and circumscribed can be very advantageously utilized. At the same time Noeldechen insists upon gargles with chlorate of potassium, or the application of ice to the neck and head. Internally he prescribes at first calomel, later quinine.

Bloebaum's actual cautery and Noeldechen's salicylic acid are obviously exhibited for one and the same reason,—*i.e.*, the sterilization of the soil whence the infection pervades the blood.

It must be left to the future to decide whether these therapeutic innovations, which, as far as can be judged from isolated trials, appear actually to possess certain advantages, will ever become popular with the majority of practitioners.

ANDERJOA, A SO-CALLED SPECIFIC FOR DYSENTERY.

FOR many years in the island of Mauritius a remedy has been known under the name of "*mauvis*" which has enjoyed the reputation of being a specific for dysentery. Dr. Clarenc has recently found that the active ingredient of this remedy is the anderjoa or anderjou plant, a native of that island, and he publishes in a letter in the *Bull. de la Soc. Méd. de L'Isle Maurice* the manner in which this remedy is prepared. One pound of the dried anderjoa plant is reduced to a fine powder, and twenty tablespoonfuls of this powder are mixed with a tablespoonful of anderjoa powder, previously roasted, together with a tablespoonful of arrow-root, and the whole divided into ten equal parts; each one of these is taken daily in an infusion. The anderjoa is the seed of a member of a group of aposcinaceæ of the species *Hollarrhena*, and is known as the *hollarrhena antidysenterica* described by Waring in the Pharmacopœia of India in 1868, p. 137. Its bark has been previously imported into Europe, and is known under the names *cadoga pala*, or pala or tellicherry bark. Its seeds have from time immemorial been regarded as tonic, antifebrile, and above all antidysenteric. Unfortunately, however, this plant has often been confounded with other species, and as a consequence it has fallen into discredit. According to Drs. Lesur and Anteleme, the *mauvis*, or as it is also known, the *lagravelle*, remedy has the following formula:

Anderjoa powder, 10 parts;
Arrow-root powder, 5 parts;
Magnesia, $\frac{1}{10}$ part;
Benzoin, 1½ parts. M.

Boil for two or three minutes in five hundred parts of distilled water, filter through linen, and cool.

S.—Dose, two or three wineglassfuls of this infusion taken on an empty stomach one or two hours before meals, while the whole is to be taken in twenty-four hours.

On the third day of treatment benzoin is to be replaced by powdered red cinchona bark, and on the sixth day anderjoa powder is to be roasted before being powdered, and may be also mixed with a little alum.

According to the observations of Dr. Lesur, this remedy is especially useful in chronic dysentery, especially when the discharges have become purulent. It should not, according to this author, be administered until the use of ipecac., calomel, and opium have failed to prevent the transition of the acute into the chronic stages of dysentery. Dr. Clarenc also adds a number of cases which seem to demonstrate the efficacy of this medicament in the chronic forms of dysentery. As it seems to be already an export, it is to be hoped that it will be subjected to further study and its exact value determined.

PILLIGANINE A POISONOUS ALKALOID OF BRAZILIAN LYCOPODION.

PILLIGANINE is the active principle of pilligan, a variety of lycopodion common in Brazil and known under the name of lycopodion sausurus. It has been prepared by M. Adrian (*Comptes Rendus*) in the following manner: The powder of the pilligan is treated by boiling water and evaporated to a soft extract, which is dissolved in alcohol. This alcoholic solution is then decolorized by the subacetate of lead, of which the excess is precipitated by the addition of milk of lime. It is filtered and neutralized by tartaric acid, filtered a second time, the alcohol distilled off, and the residue dissolved in water. It is finally filtered again, rendered alkaline by the carbonate of sodium, and shaken with chloroform. After evaporation the chloroform solution deposits a yellow precipitate, which is purified by a renewed treatment with the carbonate of sodium and chloroform. According to Houdé (*Répertoire de Pharm.*, July, 1886), pilliganine in the freshly-precipitated condition has a vinous odor, possesses an alcoholic reaction, and if a rod which has been dipped in hydrochloric acid is approached to it, it disengages whitish fumes. It is soluble in alcohol and water and chloroform, and slightly soluble in ether. It gives with sodium phosphomolybdate a yellowish-white precipitate; a pale brownish with potassium iodide; a white precipitate with tannin, and a very copious white clotty precipitate with potassium mercury iodide; with picric acid, after some time, a yellowish crystalline precipitate; with mercuric chloride and platinum chloride no reaction. A few experiments have been made with this alkaloid on animals by Dr. Bardet, which have simply served to prove that it is a powerful poison with a marked emeto-cathartic action. According to the *Lancet* (July 24, 1886), M. Laborde recently presented to the Paris Biological Society a note from M. Bardet on the action of pilliganine, one of the alkaloids of the pilligan. It is stated to be a convulsive poison with a strong emeto-cathartic action. M. Brown-Séquard remarked that it must therefore be an exception to the rule, for all known convulsive poisons were devoid of action on the digestive canal. M. Grimaux explained that the convulsive effects had been obtained from the alkaloid, while the gastro-intestinal effects had been produced by an infusion of the pilligan, so that it was not clear that the infusion contained the alkaloid; indeed, it might have contained some other alkaloid belonging to the same plant. As far as we can learn no further investigations have been made with this drug, which from its energy certainly is worthy of study.

Reports on Therapeutic Progress.

THE TREATMENT OF THORACIC ANEURISM BY A NOVEL METHOD.

MR. RICHARD BARWELL reports in the *Lancet* for June 5, 1886, a case of a man 39 years of age, with a syphilitic history and early intemperance, in whom there was an aortic aneurism springing from the lower or concave part of the arch, and progressing above, forwards, and backwards. In this case ligation of the vessels was evidently out of the question, and he was treated by rest and restricted diet, together with iodide of potassium, for a few weeks, and with small doses of aconite and salicylate of atropine. At first the tumor diminished in size, and then began a period of exacerbation, the cough became worse, and the tumor increased both within and without the thorax. The patient was now in a very critical state, although the lungs emitted very little air, in places none at all, the cough was very painful and constant, and expectoration purulent. In considering the cause of failure of the various surgical operations employed in the treatment of thoracic aneurism, it occurred to Mr. Barwell that if the area of galvanic action in electrolysis could be increased or the clots on foreign

bodies rendered harder and more stable, a successful result might be hoped for. This result Mr. Barwell thought might be effected by introducing into the aneurismal sac a steel wire arranged to lie in wide coils, then by passing along it a carefully-regulated galvanic current. In this way both the preceding methods might be combined, and a somewhat similar procedure was employed in his case. In the mechanical arrangement, however, there was a little difficulty. An ordinary trochar and canula, such as have been hitherto used for passing wire into sacs, was evidently unfitting on account of its conducting power. A tubular needle of vulcanite, with a steel tip and several other devices, were procured and rejected. At last a tube of ivory, sharpened like a hypodermic needle, was accepted as the most feasible arrangement. On March 2, the skin being rendered insensitive by the injection of cocaine, a fold was pinched up, and a little incision made from within outwards over the tumor; the ivory needle was then thrust in without difficulty, and about ten feet of the finest steel wire passed into the sac. The wire, having been first wound on a wooden cylinder half an inch in diameter and being of the best steel, must, after being paid through the needle, coil itself up again in the sac. Dr. Murray undertook the management of the galvanic arrangements, and he gives the following short account: "The wire was connected with the positive pole of an eight-celled Grenet's battery. The negative was applied to the upper dorsal region a little to the left of the middle line. Between the electrode and the skin was interposed a piece of amadou about a foot square, thoroughly saturated with hot water. A galvanoscope and a voltameter (Gaiffe's) were included in the circuit. The resistance in the voltameter was so great that the strength of the current did not exceed four milliampères. Twenty cells of a Coxeter's 'practitioner's voltaic battery' were therefore added to the Grenet battery, and the current strength was raised to about nine or ten milliampères. At this level it was maintained during the operation. The current was passed for an hour and ten minutes. Some redness of the skin was caused by the negative pole, but no indication of irritation at the place of puncture." For twelve hours signs of consolidation were absent, or nearly so; but at the end of that period the pulsation seemed considerably more distant and the tumor much harder, and this change rapidly increased. The lungs began to unload themselves of their accumulated pus and muco-pus; expectoration, very difficult previously, became easy and somewhat copious, showing decrease of pressure on the bronchi. But on March 5 (fourth day of operation) a new tumor appeared to the right of the sternum, and rapidly increased. The man also became weaker. He died on March 9, a week after the attempt, partly from exhaustion, and partly, as it appeared, from rupture of this second sac.

At the post-mortem it was found that the interior of the bronchi were of a deep purple color; in places the mucous membrane was nearly or entirely absent; the substance of both lungs airless and tough, sinking in water, but not from inflammatory consolidation. The very large aneurism occupied the concave aspect and lower part of the front of the first and second part of the aorta; it had eroded a portion of the sternum and the ribs; the anterior portions of the almost solid lungs, more especially of the right lung, seemed to form part of the sac. On opening the aneurism, it was found to consist of two parts,—a left portion, much the larger, and a secondary or right portion, which seemed to have recently increased in size, and which, where the lung formed a part of the wall, had burst, and given exit to two pounds and eight ounces of blood, which was found in the right pleura. The left portion contained large wide coils of steel wire, each of which was surrounded by a pretty thick coat of firm colorless fibrin, strongly adherent to it at many places,—that is to say, wherever the metal was in contact, or within a moderate distance of the wall, the wire was bound to the sac by this fibrin, thus greatly increasing its strength and resisting power.

Mr. Barwell points out that his attempt was evidently too late; the man's lungs were already all but useless. The conformation of the aneurism also was unfortunate, in that it possessed a secondary sac, into which the wire could not pass. Not a new one developed after the operation, for the man stated in writing three days before his death that the tumor to the right of the sternum had existed two years previously. The endeavor to save life was by these circumstances frustrated. But consider what the condition of things found in the large sac means. Evidently it means that by passing a galvanic current not merely along two or three needles, which are afterwards removed, but along some feet of wire, which is left *in situ*, we have a device by which a considerable quantity of hard, firm, and persistent clot can be produced in

large quantities, even though, as in this case, the aneurism may be close to the heart. Mr. Barwell believes that if a galvanic current and coils of wire are to be of service in such cases, they will only be so when used in combination, after the manner thus illustrated.

THE INFECTIOUS CAPACITY OF CHRONIC GONORRHŒA.

NEISSER, the discoverer of the gonococci, addressed the meeting of German physicians at Strassburg on the interesting subject of the infectiousness of chronic gonorrhœa (*Centralblatt für Klinische Medizin*, April 3, 1886). He believes that the question whether chronic gonorrhœa is infectious or not cannot be answered summarily, but can solely be decided from case to case by repeated examinations of the gonorrhœal secretion for gonococci. Examining one hundred and forty-three cases of chronic gonorrhœa for gonococci, he found the proportion of cases giving a positive result to be almost equal to that giving a negative result.

Neisser recommends as the most effective treatment nitrate of silver in a proportion of 1 to 3000–2000, or a five per cent. solution of salicylate of sodium, the remedy being best injected with a soft thin catheter, having at its point several openings. In a case presenting even on repeated examinations no gonococci at all, treatment is better wholly avoided. The internal administration of the balsam of copaiba appears to be a useful measure.

This recalls a statement of two French observers, Sinety and Hennegue (vide *Progrès Médic.*, 1885, No. 33), which is in opposition to Neisser's claim. In their experience injections of nitrate of silver were unable to kill the gonococci found in the urethritis of females. The same negative results they obtained also with permanganate of potassium, ozone-water, and even with corrosive sublimate.

THE SURGICAL TREATMENT OF SUBINVOLUTION.

At a recent meeting of the alumni association of the Woman's Hospital in the city of New York, DR. A. PALMER DUDLEY read a paper with the above title (*Amer. Journ. Obstetrics*, July, 1886).

Dr. Dudley said that this condition was not particularly noticed by gynecologists, and that there was especially a paucity of histological evidence as to the nature of the condition. Retzius, of Sweden, had called attention to this twenty years ago. The reader then gave a history of the physiological processes leading to an increase of uterine tissue and to involution and subinvolution.

The terms areolar hyperplasia, chronic metritis, and subinvolution were often misapplied. Most writers gave more attention to chronic metritis (which was a misnomer) than to subinvolution. He had sought to discover the histological conditions present in this affection and would give the views of various authors. Dr. W. H. Welch, in a personal letter to him, had stated that he could find no evidence of any true inflammatory process in subinvolution. Cohnheim had reached practically the same conclusion.

The usual treatment of subinvolution by local remedies, iodine, phenol, douches, etc., even when faithfully carried out, relieved the patient only for a time; the uterus again increasing in size and the symptoms returning when the treatment was suspended. The reader believed that Emmet's operation for lacerated cervix was the best means of curing subinvolution, even when there was no laceration. He then gave in detail the histories of twelve cases of subinvolution, all of which suffered from pelvic distress and dragging, supra-pubic pain, backache, leucorrhœa, etc., the uterus being tender on pressure. Seven of these cases had laceration of the cervix; in six there was no laceration; ten suffered from dysmenorrhœa; eight from constipation and dysuria. Treatment by means of hot douches, iodine, glycerin-tampons, the tapping of cysts, curetting, etc., was faithfully carried out, and the patients were relieved, but were not cured.

After this hystero-trachelorrhaphy was done where the cervix was lacerated; in the other cases a slender wedge was removed from the cervix, the apex of the wedge being carried deep enough to divide the circular artery. The depth of the uterine cavity was in all cases carefully measured when the patients began treatment, before the operation was done, and again some time afterwards. Of these twelve cases, there was in all a marked diminution in the length of the uterine cavity and improvement in the symptoms; in three cases, where there was displacement, the uterus returned spontaneously to its normal position; a thirteenth case, in which the wedge-shaped mass was excised, was complicated by the presence of a large fibroid; here, after ninety days of ordinary treatment, the uterus measured three and three-quarter inches (a diminution of one-quarter inch by treatment);

fifty-four days after the operation the uterus measured two and five-eighths inches, and there was marked relief from symptoms and diminution in the size of the fibroid.

ARTERIAL PRESSURE IN BRAIN AND FOREARM AS INFLUENCED BY VARIOUS DRUGS.

CAPELLI and BRUGIA, of Milan, have made some very interesting experiments on the blood-pressure as altered by various drugs. We condense their principal conclusions arrived at from *Schmidt's Jahrbücher*, June 22, 1886:

1. Inhalations of nitrite of amyl cause a fall in the pressure, first in the brain and then in the forearm. Besides, there are, however, some variations of pressure in both regions, which are not isochronic.

2. Morphine applied hypodermically in small doses produces at first a vascular contraction, and then a dilatation, most pronounced during sleep. The latter condition leads to an increase in volume of both the brain and the forearm.

3. Chloral causes at first cerebral anæmia on account of the decreased resistancy of the peripheral arteries; later there appears a vascular paresis, with a subsequent increase in volume of the brain.

4. Paraldehyde does not always produce hypnotic effects. Soon after application of the drug the cardiac power increases, and reaches its maximum during the deepest hypnosis. If no sleep result, this action upon the heart is less pronounced.

5. Hyoscyamine at first acts as an excitant; later the frequency of the pulse increases, while its pressure falls, until ultimately the normal state of both frequency and pressure are regained.

In a cold bath the peripheral arteries contract, the volume of the brain augments, and the pulse is first quickened and later slowed.

In a warm bath the experimenters found, contrary to the usually assumed venous stagnation of blood in the brain and a diminished vascular tension, during the entire bath a certain degree of vascular contraction and cerebral anæmia, with peripheral vascular congestion.

A CASE OF IDIOSYNCRASY WITH REGARD TO TANNIC ACID.

DR. J. M. WILLIAMSON reports in the *Practitioner* for July, 1886, a case of a married woman, aged 57, who had been suffering from anæmia from hemorrhoidal bleeding, which after operation left her the subject of distressing irritability of the bladder. Previously this trouble had always yielded to a mixture containing bicarbonate of potassium and tincture of henbane and an infusion of buchu; but this medicine failing to produce any effect, Dr. Williamson administered a mixture of sulphate of atropine, the anissated solution of ammonia (German Pharmacopœia), and the infusion of uva ursi. This seemed to produce symptoms of an asthmatic paroxysm, accompanied by a short, violent, suffocative cough, and with decided mental confusion, although vomiting and nausea were absent. Dr. Williamson concluded that this peculiar effect, the responsibility of atropine having been excluded, was attributable to the tannin which is so abundant in uva ursi. The symptoms passed completely and permanently away between two and three hours. This view as to the production of these peculiar symptoms was confirmed by Dr. Williamson's previous experience in the same case, where the administration of a rectal injection of 30 grains of tannic acid in alcohol and water for bleeding from hemorrhoids produced similar symptoms to those above alluded to, although very much more severe.

So also a number of other instances. One especially where, after emptying a box containing tannic acid, she had blown into it, inhaling a portion of the tannic acid; similar symptoms were produced. It seems therefore that there existed in this patient an idiosyncrasy with regard to tannic acid. Tannin injected into the rectum, tannin accidentally inhaled, the taking into the stomach the infusion of uva ursi leaves, all were followed by identically the same symptoms, while the curious fact is also noted that the application to the skin of an ointment of galls and the administration of gallic acid internally produced no disturbance.

These points are well worthy of recollection.

ACTION OF SCOPOLEINE.

PIERD'HOUY, desiring to directly compare the action of scopoleine with that of atropine, applied, as stated in *Nouveaux Remèdes*, 1886, No. 3, p. 61, in four healthy persons, atropine to the right eyes and scopoleine to the left eyes. Both alkaloids were furnished by Merck, and were employed in an equal solution (1 to 40). In the action of both remedies the observer noted a periodical simul-

taneous increase and decrease. Somewhat sooner than in the atropine eye, about eight minutes after application, the scopoleine eye presented an increase in the vertical diameter of the pupil, which, after a quarter of an hour, was followed by a return to the normal state. In scopoleine the maximum of mydriasis and paresis was reached in forty-five minutes, in atropine in sixty minutes. Twelve hours later, the pupils of the eyes treated with scopoleine became again dilated, remaining thus for three days. This return of physiological action after so great an interval is characteristic of scopoleine, and has never been observed in the case of atropine. Led by these researches, Pierd'houy applied scopoleine in a case of chronic iritis, and obtained the desired effect without the eczematous after-effects following the atropine application, and which can only be avoided by applying cocaine simultaneously with atropine.

Pierd'houy pronounces the mydriatic power of scopoleine as far superior to that of atropine, and advocates the employment of the former alkaloid in ophthalmological practice.

NEW METHOD FOR RELIEF OF RUPTURED PERINEUM.

At a recent meeting of the Medico-Chirurgical Society of Montreal (*Canada Medical Record*, June, 1886), DR. TRENHOLME read a paper on this subject, exhibiting drawings of the new method, as follows: This disease must be as old as parturition itself, and yet, beyond the adjustment of the parts, binding the knees together, in recent cases no really successful advance had been made for its cure till the late ever-lamented Dr. Sims introduced his silver suture. The operations of Baker & Brown and others were not of any real value, and perhaps the cause or nature of failure was not fully brought out till Emmet's paper upon this subject was given to the world. How much progress has been made can hardly be conceived of by those who have graduated during the last twenty-five years. Yet one of the best surgeons may endeavor to dissuade a confrère from attempting the operation, stating that "it is sure to be a failure." It is a recognized factor in the causation of subinvolution of the vagina and uterus, and its results are not limited to these organs, but that the tubes and varied ligaments share in the same mischief. It is a fruitful cause of retrolaxations of the uterus and prolapsus of bladder. Of all the marital misery and personal distress need be said nothing: these, of course, vary with the peculiarities of individual cases and the extent of the disease. There is one remark Mr. Trenholme makes as to what is known as the perineal body. Some writers have made light of its existence, because its anatomy and relations are not sufficiently definite to merit, as they think, this appellation. That every uninjured perineum has such a body is unquestionable, and the restoration of this body is *the one* object of perineorraphy. An operation is successful or unsuccessful, according as to whether this end of the operation is or is not attained—without it the natural support of the pelvic viscera is impossible. Not only is there apt to be hernia of the anterior rectal wall, but prolapsus of both bladder and uterus. The best success heretofore has followed Emmet's operation. His conception of the trefoil character of the surfaces to be brought together are based upon a right conception of the anatomy of the parts. The perineal body being the central, and the lateral surfaces the outside leaves of the trefoil, each sulcus represents the lateral borders of the vagina and rectum. Perfect union of these surfaces leaves but little more to be desired. In the first place, the loss of any tissue is to be avoided, and sure union by first intention the desideratum to be attained. Mr. Trenholme's operation is based upon the recognition of the immense value of the perineal body. He describes it as follows: "I denude the surfaces to the fullest extent of the parts injured. This denudation is accomplished by the removal of the covering of the parts to be denuded,—*i.e.*, the cicatricial surface in *one* piece. For this purpose the first incision is made at the upper part where the edge of the skin coalesces with the cicatricial surface; the knife is entered at the highest point on the right side, and the incision brought down to the lowest part of the fourchette, when it is met by a similar incision on the left side. The lowest part of the angle is then seized with the forceps and carefully dissected upward, taking special care to remove the whole surface without incising the flap; this dissection is carried on till the surface represented by the original wound is uncovered. The next step is the introduction of the shield-sutures (and here I would say a word in favor of the catgut suture which I adopt). It is by far the best, as it gives the greatest possible extent of surface to surface, —much greater than can be secured by the interrupted or any other suture. Two deep sutures usually suffice, and these—whether

silver, silk, or catgut—are passed in and secured by clamp shot upon an ivory shield. The first suture should be inserted low down, and about three-quarters of an inch from the edge of the wound. It must be passed under the denuded surface so as not to appear, and brought out on the opposite side at a point corresponding to that of insertion. The second deep suture is similarly introduced higher up. The last deep suture should catch the flap, and the interrupted suture will do for this. The edges of the wound are coapted by horse-hair sutures, and the upper part of the flap and around on the right and left side are secured by catgut sutures; this leaves the united surfaces in the shape of the letter T. The vaginal surface is perfectly covered, and in no way can a drop of fluid enter the wound or interfere with union by first intention. There is very little pain, inasmuch as the deep shield-sutures allow of distention. Interrupted sutures should not be used. Where the rupture extends into the rectum, the flaps are carefully brought together by a running catgut suture, and the operation completed as in this case. The objection to all other operations was that it left the vaginal incision open, which, sometimes, therefore, interfered with union by first intention. By my method this is now impossible, and when catgut is used the results of the operation leave absolutely nothing more to be desired. The following points are gained: Perfect union, perfect restoration of the perineum, no loss of substance, and no after-fever worthy of the name."

NOTE ON THE PHYSIOLOGICAL ACTION OF TANGINA.

QUINQUAUD, reviewing the action of tangina, the drug used by the inhabitants of Madagascar for ordeals, attributes its principal effects to its influence upon the central nervous system (*Centralblatt für die Medicinischen Wissenschaften*, April 24, 1886). Applied to frogs the drug suspends the voluntary motions, heightens the reflex excitability, and causes clonic and tonic convulsions. Later, symptoms of paralysis set in, though the excitability of the muscular apparatus and of the peripheral motor nerves remains intact. Ultimately, however, the peripheral nerves appear as if affected by a curare-poison. In dogs the convulsions are preceded by vomiting, diarrhœa, and tenesmus. The working power of the muscles remains normal until death ensues. Respiration is first quickened, later slowed; the frequency of the pulse is transiently heightened, then lowered; the blood-pressure is at first raised, and later depressed through cardiac weakness. The poison is thus seen to affect simultaneously circulation and respiration, the cardiac action outlasting respiration. Death ensues through respiratory failure.

Quinquaud administered an extract of tangina in doses of 1 to 1½ grains in various affections, and arrived at the conclusion that the drug could be utilized in paralytic affections of a toxic nature and in tremor and atony of the intestines. In two cases of urinary incontinence the drug led to a distinct improvement. If headache, nausea, vomiting, or a sensation of weakness sets in, the drug is to be suspended.

THE TREATMENT OF ORCHITIS AND EPIDIDYMITIS.

There is such a diversity of opinion as to the best treatment of orchitis and epididymitis the result of acute gonorrhœa, that the results obtained by MR. FREDERICK W. LOWNDES (*Lancet*, July 24, 1886) for the last eleven years in the Liverpool Lock Hospital are of considerable importance. The plan practised in this hospital is almost invariably that introduced by Mr. Furneaux Jordan in 1869, namely, by painting the affected testicle with a strong solution of nitrate of silver (two drachms to the ounce), at the same time enforcing strict rest in bed, and supporting the inflamed organ upon a small pillow so as to prevent it hanging down. Mr. Lowndes has invariably employed the same treatment, and in eleven years has treated two hundred and sixty-nine cases. He has always found his plan highly successful. The acute pain often amounting to agony is soon subdued, and in the majority of cases the organ returns to its normal size in the course of a few days. Sometimes a second painting is necessary, but this then suffices. The same plan of treatment has also been used by him successfully in private practice. When the patient cannot be induced to take absolute rest in bed, and when the patients are compelled to follow their usual occupations, the recovery must obviously be slower, as it is not possible by suspensory bandages or by means of handkerchiefs, however skilfully applied, to insure such perfect rest as when the patient is lying in bed. While the rest is an important item in the treatment, it is not by itself sufficient to effect a cure. The immediate effects of the nitrate of silver in allaying the pain are most marked, though for obvious

reasons the nitrate must act more powerfully while the organ is in a state of quiescence than when constantly active.

ON THE ANÆSTHETIC ACTION OF SUBCUTANEOUS INJECTIONS OF COCAINE.

WÖLFLER has made some very interesting experiments with the view to ascertain the anæsthetic effects of hypodermic applications of cocaine (*vide Heitler's Centralblatt*, April, 1886, p. 172). He found that an injection of about ½ drachm of a five per cent. solution of cocaine produces within two to three minutes an anæsthetic condition lasting for twenty to twenty-five minutes. The region of complete anæsthesia had a diameter of two to three centimetres, while the adjacent skin was in a state of semi-anæsthesia for a distance of two to three centimetres. Further injections widened the sphere of anæsthesia. Needles introduced into the skin to a depth of three centimetres were not felt.

Wölfler employed these injections practically for the extirpation of small tumors, removal of foreign bodies, opening of abscesses, and similar minor operations. In larger incisions the injections are best made at both termini of the incision. Wölfler obtained excellent results with cocaine injections in neuralgias, especially of a strictly localized nature. Though not meeting himself with any accident in the employment of cocaine, Wölfler advises nevertheless to be cautious in its use, as Heyman had recently observed a severe intoxication after its application. (Cocaine had been applied by the brush to the larynx of a boy 10 years of age previous to the removal of papillomata, whereupon a state of apathy set in which lasted for five hours.)

THE ALLEGED POISONOUS PROPERTIES OF THE COMMON PARSNIP.

Two of the contributions from the department of pharmacy in the University of Wisconsin are devoted to the subject of the alleged poisonous properties of the root of the common parsnip (*Pastinaca sativa*), when growing wild. It appears to be a popular belief in some parts of the United States that if the edible roots of the cultivated parsnip remain three years in the ground they revert to the wild form, and then possess poisonous properties. MR. J. T. BENNETT failed, however, to separate from wild roots any principle that produced poisonous symptoms when administered to the lower animals, and MR. WELLS gives direct testimony that he has eaten, both cooked and raw, roots from a parsnip patch that has been allowed to run wild for probably half a century, It is concluded, therefore, that the frequently-reported cases of poisoning by wild parsnip root ought to be attributed to one or other of the umbelliferous roots resembling it which are known to possess poisonous properties.—*Pharm. Journ.*, July 31, 1886.

ON ANÆSTHESIA PRODUCED BY COCAINE THROUGH INTERVENTION OF ELECTRICITY.

We are indebted to our Viennese contemporaries, the *Wiener Med. Blätter* (No. 6, 1886) and the *Centralbl. f. Therapie* (No. 4, 1886) for the description of Wagner's interesting method, which we have already shortly alluded to in a previous issue, of producing anæsthesia of the skin by the combined action of cocaine and electricity. Wagner utilizes the so-called cataphoric property of the galvanic current, which enables him to render the skin anæsthetic over any wanted area, provided the epidermis is intact. The cataphoric action of the galvanic current depends upon its power to direct liquids contained in a porous receptacle from the anode to the kathode. The living tissue represents such a porous receptacle, and is well adapted to execute this cataphoric action of the current. The quantity of liquid moved in a certain unit of time is the greater the stronger the current and the poorer the conducting quality of the liquid is.

The application of this peculiar action of the galvanic current for the introduction of medicinal agents into the organism has been previously attempted by other experimenters without having furnished very encouraging results. This failure Wagner attributes to the choice of the employed drugs, which probably did not fulfil the requisite of being active in very small quantities without demanding a strict fixation of the dose. Cocaine answers fully to this requisite. Wagner's *modus operandi* for the production of anæsthesia consists in applying a flat electrode invested with leather or flannel and saturated with a solution of cocaine to the skin; this electrode is made the anode of a galvanic current of a medium strength. After a few minutes the electrode is removed, when the entire surface of the skin which was covered by the electrode will be found to be completely anæsthetic. The degree of anæsthesia is propor-

tional to the strength and the duration of the current; its duration is from ten to fifteen minutes.

The larger the area to be anæsthetized the greater must be the strength of the current. Wagner uses a circular anode-electrode of two and a half centimetres and a five per cent. solution of cocaine with a current of six milliampères for four to five minutes. For the head and neck especially this strength suffices, while for the trunk and extremities currents of ten to fifteen milliampères should be employed.

If a deep anæsthesia is intended Wagner recommends to place the kathode diametrically opposite to the anode.

The quality of the cocaine solution influences the cataphoric effects only inasmuch as these are the greater the poorer the conducting quality of the solution is. A stronger solution is a better conductor than a weaker one, and therefore less eligible than the latter. On the other hand its higher degree of concentration warrants effects not anticipated from the use of a weaker solution. It has not yet been ascertained whether or not the stated advantage and disadvantage equalize each other.

Wagner's practical experience with the procedure is limited though encouraging. Thus in a small operation he became convinced that incisions could be made through the entire thickness of the cutis without occasioning any pain. If the anæsthesia does not penetrate deeply enough, the deeper parts of the wounds can, as suggested by Wagner, be rendered anæsthetic by applying the cocaine solution directly to them.

In the conclusion of his paper, as appearing in the above-quoted journals, Wagner refers to Corning's observation, viz., that the effect and duration of a cocaine injection can be increased if the Esmarch bandage is applied a little while after the injection. Applying the cocaine by aid of electricity, Wagner confirmed Corning's observation, and found that the anæsthesia could be extended over one-half by the use of the Esmarch bandage.

BROMIDE OF POTASSIUM AND LOTIONS OF ETHER FOR SUNSTROKE.

Dr. C. H. Hughes publishes in the *Weekly Med. Review* (St. Louis, July 17, 1886) a note in which he calls attention to the great value of bromide of potassium in this affection, by the mouth when it will be so taken, or by the rectum when the patient cannot be induced to swallow it. According to Dr. Hughes, it bring about more speedily in the gravest cases the mental recovery of the patient, and averts the serious brain sequellæ, immediate or remote, of this always serious affection. Dr. Hughes claims that the acute insanity of sunstroke much sooner subsides under its use than from the cold treatment alone, and that the cold treatment ought always to be suspended as soon as the patient comes to himself and appears drowsy and feels chilly. His plan is to give from sixty to one hundred and twenty grains during the first hour, and sixty grains every hour or thirty grains every half hour, largely diluted in peppermint water; sulphuric ether freely to head and spine and fanned away till six ounces are used; ice at the same time to arms, wrists, abdomen, over the heart, legs, etc., and, in extreme cases of comatose collapse, ice-cold water into the bowels with ginger and capsicum, but ordinarily moderately cold water with two hundred grains of bromide of potassium.

He reports that a recent violent case with maniacal delirium, fear of being murdered, and requiring six men to hold him down, was subdued, as all his previous cases have been, by the free use of bromide of potassium, ice, and ether, passing into a tranquil sleep with soft and regular pulse and respiration within three hours after the beginning of the attack.

The man was a laborer, struck while at work in the street. He had drunk some that morning and more the night before, but was not intoxicated. He was thirty years old, and married.

The patient took altogether two hundred and forty grains during the first twenty-four hours, and will take two hundred and forty more, at the rate of ninety grains a day, before treatment is discontinued.

He was allowed some ginger ale when he began to complain of being cold, and ice removed and dry clothes put on him.

The remote consequences of sunstroke are very serious in various chronic forms of head trouble, especially in insanity, and few persons who have once had a sunstroke can ever after well tolerate heat. The chief and greatest value of the bromide of potassium treatment, at the time of the attack, is in averting these consequences.

Of course, atropine and iodide of potassium are not to be disparaged, and may be blended with the bromide treatment. And muriate of ammonia and aromatic spirits of ammonia may immediately follow it.

ON THE POISONS EXISTING NORMALLY IN THE ORGANISM AND THE TOXIC NATURE OF THE URINE IN ESPECIAL.

The GAZETTE has already reviewed the very interesting investigations of several French observers, especially of Gautier, concerning the ptomaïnes, and we feel convinced that also the present discussion of the subject, abstracted from BOUCHARD'S paper, as appearing in the *Gaz. Hebd.*, vol. xxxiii., Nos. 13, 14, pp. 205–221, 1886, will be read with interest. Among the chemical constituents of the animal organism there are some which possess distinctly toxic properties. Man, under normal conditions, avoids intoxication from this source by the following procedures: 1. Several of the poisons are being destroyed within the various organs by oxidation processes; 2. Others are being retained or destroyed by the liver; 3. The majority of them is being eliminated from the system by various channels.

Bouchard endeavored to measure the quantity of toxic matters contained normally in the urine, assuming as the unit of measure (*unité toxique*) a quantity corresponding to the dose fatal to each kilogramme of body weight of a rabbit. In these investigations the normal human urine, after being neutralized by bicarbonate of sodium, was rapidly injected into a vein.

The injection of 10 to 15 c.c. (2 to 3 drachms) of normal human urine caused the following appearances: The pupils contract very strongly, and respiration becomes hurried but shallow. Soon the motions of the animal grow weak and uncertain, and urination increases. Death ensues finally under reduction of temperature and of reflex activity. Heart-beats and contractility of the smooth and striped muscles continue even after death has set in. If in the beginning of the coma the injection of urine is stopped, the animal recovers rapidly.

The fall of temperature caused by the injection Bouchard explains as caused by a diminished generation of heat; injection of water, on the other hand, increases the production of heat.

It is not a little interesting to find that, according to Bouchard's calculations, the quantity of poison eliminated by a healthy man during two days and four hours is sufficient to poison himself.

In another communication, Bouchard compares the poisonous substances of the urine eliminated during sleep and in the waking condition. He found that the nocturnal urine, in spite of having a higher specific gravity than the diurnal secretion, contained only one-half to one-quarter of the poisonous quantity of the former. The urine reaches its toxic minimum about the time of one's falling asleep, and its maximum sixteen hours later.

The question naturally presents itself, whether the higher toxic character of the urine voided during daytime entertains any relations with the ingestion of food. During alimentation potassium and the alkaloids allied to the peptone group are being resorbed, and it is possible that the toxic substances eliminated by digestion in the liver enter the circulatory channels by means of another resorption. The day urine contains twice as much potassium as the night urine. Still, Bouchard showed that only one-fifth of the poisonous substances of the day urine and only one-third of the poisonous substances of the night urine could be attributed to the potassium salts. And still less can the other mineral salts of the urine be considered in this direction. If, however, the ingestion of food were the only factor in question, the maximum and minimum of the poisonousness of the urine would be directly opposed to each other as far as time is concerned.

The day and night urine, besides showing quantitative differences, present also some qualitative variations. The night urine causes cramps and convulsions; the day urine is a narcotic, and shows little or no convulsive action. Bouchard even found that both urines were antagonistic to each other, the one being the antidote for the other.

Bouchard's researches not yet being closed, we hope to have another opportunity of resuming this interesting topic.

URETHAN AS A PHYSIOLOGICAL ANTIDOTE TO STRYCHNINE.

Some very interesting observations have quite recently been made by PROFESSOR COZE on the subject of the physiological effects of urethan, and more particularly on its antagonism to those of strychnine. The first point is its extreme tolerance when injected subcutaneously, or into the peritoneal cavity. 8 to 10 grains so injected did not set up any local irritation in the frog, nor did 30 grains in the guinea-pig. No symptoms of gastric irritation were produced by from 80 to 100 grains given by the mouth in rabbits. The effect of the drug on the blood appears

to consist in an increase of the amount of oxygen (four per cent.); and the nervous exhaustion which follows its use may, perhaps, be attributable to the greater difficulty with which the blood parts with its oxygen in favor of the nervous system. Its influence on the tetanus of strychnine-poisoning was shown in the following manner: A frog weighing just under an ounce was injected with $\frac{1}{700}$ of a grain of sulphate of strychnine (the minimum fatal dose being $\frac{1}{1500}$ of a grain, according to Falck); and as soon as tetanus declared itself, 5 grains of urethan were injected. Four minutes later, the tetanus ceased, and the muscles became completely relaxed. The next day, to the professor's astonishment, the animal was all right again. This experiment was repeated many times, with larger and smaller doses of urethan; the effects were not so lasting with doses of less than 5 grains, but, if the tetanus returned, it could be almost instantly arrested by a further injection. A mixture of strychnine and urethan injected together gave rise to no tetanic symptoms, but rather to muscular relaxation. On the guinea-pig, the effects obtained were the same; this animal being somewhat less amenable to the action of strychnine, $\frac{1}{80}$ of a grain of the drug was injected simultaneously into two guinea-pigs. A quarter of an hour later, both the animals being tetanized, one of them was injected (into the peritoneal cavity) with 15 grains of urethan; the convulsions ceased; the respiration coming down first to 72 and then to 40 per minute. The other animal, the check experiment, succumbed in twenty minutes to the effects of the strychnine. For a rabbit weighing two and a half pounds, the minimum fatal dose of strychnine is $\frac{1}{120}$ of a grain. Accordingly, to one weighing three pounds, successive injections were administered, amounting to $\frac{1}{40}$ of a grain of the sulphate of strychnine, rapidly followed by a violent attack of spasm; the animal leaped and fell down breathless, and in a state bordering on asphyxia. 50 grains of urethan were then promptly introduced into the stomach, after a few artificial respirations. In the course of a few minutes, the tetanic rigidity began to lessen, first in the hinder part of the body, respiration became deeper, and the animal fell into a quiet sleep. Two hours later, the rabbit raised its head without any convulsion, and gradually recovered. The next day, the only symptom was a little weakness in the hinder legs; and, on the next day but one, the animal had to all appearances completely recovered. The contrary experiment was also made, the urethanized animal being injected with $\frac{1}{50}$ of a grain of sulphate of strychnine, without the production of tetanus. All the experiments were repeated a certain number of times, but always with the same result. In other experiments, he administered a mixture of 50 grains of urethan with $\frac{1}{50}$ of a grain of strychnine, and no spasm or rigidity followed. He pushed the strychnine to $\frac{1}{8}$ of a grain without any apparent effect; and even with $\frac{1}{4}$ of a grain, although a few spasms manifested themselves, the animal did not die. On a dog weighing twenty-five pounds, $\frac{1}{5}$ of a grain of strychnine was counteracted with 75 grains of urethan, and in twenty minutes the animal got up and walked away with some difficulty. The next day he was all right again. Dr. Coze suggests that clinical use should be made of the drug in conditions attended with convulsions, and more especially in cases of tetanus.—*Brit. Med. Journ.*, July 24, 1886.

INTOXICATION WITH CHROMATE OF POTASSIUM.

In the *Deutsche Medicinische Wochenschrift*, xii. 17, 1886, Dr. Gläser reports the following instructive case:

A gilder, 26 years of age, disgusted with life and its trials, had made up to his mind to die, and bought for this purpose five pfennige (one and one-quarter cents) worth of chromate of potassium, which he took dissolved in water. Soon after ingestion of the drug the man drank large quantities of milk. Vomiting and diarrhœa set in very soon. In the evening the patient was visited by the physician, who found widely-dilated pupils, severe gastric pains, and an albuminous urine. After washing out the stomach of the patient, the physician ordered castor oil, injections of oil of camphor, and applications of ice to the stomach. On the following day the gastric pains had decreased, the urine remained albuminous, and contained hyaline and granular cylinders. The temperature was elevated considerably above normal. Mouth and tongue showed no signs of cauterization. Ten days later the urine was normal. Diarrhœa and elevation of temperature, however, lasted for two weeks. The patient recovered fully.

Gläser believes that the patient took at least 2½ dr. of the poison, and regards the recovery as remarkable, as authorities like

Prof. Naunyn, of Königsberg, claim that a few grains of the poison suffice to kill.

It seems probable that the milk drank by the patient prevented the fatal issue.

BORIC ACID POWDER IN THE TREATMENT OF GRANULAR LIDS.

Dr. James L. Minor states in the *New York Med. Journ.*, July 31, 1886, that he was led to the use of boric acid powder in the treatment of granular lids by the beneficial effect produced by this agent upon the tissues somewhat resembling the conjunctiva in this disease. He had seen granular tissue on the ear and on ulcers in other parts of the body and trunk, and observed that in the nasal cavities the thickened and swollen mucous membrane was often thinned down under the continued use of boric acid. He gives the following details as to its use:

1. *Method of applying the Powder.*—The lids being thoroughly everted, the pulverized acid is freely dusted over the exposed conjunctiva with a camel's-hair brush. The amount will, of course, vary, but in most cases of granular lids a quantity should be introduced sufficient to cover completely the parts to which it is applied. The frequency of application will vary from three times a day to three times a week—this difference depending upon both the individual and the disease. It will be safe to repeat the application as soon as the disagreeable symptoms which have been relieved by the remedy begin to appear again.

2. *Effects produced by the Powder.*—Its immediate effect is to produce a burning, gritty sensation, with some pain, lasting for five or thirty minutes, and a free serous discharge, after which relief is experienced, and the lids feel freer, lighter, and smoother than before its use. This beneficial effect lasts for a period varying from a few hours to several days. The conjunctiva at times shows reduction in swelling and thickening as soon as the irritation following its use has passed off. This is, however, more noticeable after the remedy has been used for a week or more, when perceptible thinning of the conjunctiva is observed, and clearing up of the cornea if pannus be present. When boric acid powder is applied to succulent tissue or a swollen mucous membrane, a free serous discharge quickly appears, which lasts for ten or twenty minutes. This discharge occurs largely at the expense of the volume of the tissue to which it is applied, and is followed by a shrinkage of the same. This is best illustrated in the nasal cavities, when they are closed or nearly so from swelling of the mucous membrane. A short time after the use of the acid the passages become clearer and freer, and this is noticeable to the examiner as well as the patient. This serous flux is probably of an osmotic character. Its escape relieves succulent tissue of its superabundance of serum, thereby causing contraction, which facilitates a healthier circulation and better nutrition. Its action as an irritant is in the same direction, and is especially instrumental in the cure of corneal affections. The power possessed by boric acid of restraining micrococcal development, of diminishing diapedesis, of lessening the amœboid movement of leucocytes, and other tissue and chemical changes which it produces, are factors which enter into the theory of its action. When the powder is applied to a granular conjunctiva, it not only covers the entire membrane, but enters the cracks and crevices between the granulations, and brings about the changes indicated upon the conjunctiva as a whole and upon the granulation individually.

3. *Cases suitable for and Facts governing its use.*—Dr. Minor has used boric acid powder in all forms of granular lids, and in most varieties of conjunctivitis, with benefit. He thinks, however, that the papillary form of granular lids is most amenable to its influence. Pannus in every instance has been markedly improved, and in many cases cures have been effected. In ophthalmia neonatorum some cases have received benefit, but he relies but little upon the powder in purulent cases. On the contrary, it acts best when the secretion is scanty and serous. He has often noticed that the conjunctiva became less tolerant of its action after the powder had been used for three or four weeks, and in such cases the treatment has been changed with success. Boric acid in this particular is similar to other agents in general use for the treatment of granular lids, for it is often noticed that a remedy will *wear itself out*, as it were, and it becomes necessary to substitute another agent for the one which has been used. Boric acid is only one of these remedies, and is no more of a specific than others, yet it is an important addition to our list of efficient remedies for a disease which is often rebellious and always obstinate and protracted. It is less painful than other remedies, its effects in this particular being often recognized by the patient, who will ask to have the powder repeated, because it is less painful and more efficient in affording relief than other agents which have been

employed. Jequirity has done much toward simplifying and hastening the treatment of granular lids, but there will always remain a large contingent in which the special condition or the general surroundings of the patient will debar its use, and in such cases as these we must resort to those remedies that are known to be of value—possibly less brilliant, but entirely free from danger.

TOXIC EFFECT FROM THE PERMANGANATE OF POTASSIUM.

In view of the attention which potassium permanganate is now attracting in the treatment of amenorrhœa, two cases of toxic symptoms from its internal administration, reported by Dr. W. D. Bidwell (*Boston Med. and Surg. Journ.*, Aug. 12, 1886), are worthy of attention.

The first case in which Dr. Bidwell used the drug was that of a girl 19 years of age, with advanced phthisis and amenorrhœa of ten months' standing. Dr. Bidwell administered potassium permanganate in 2-grain capsules three times daily for two days, which was followed on the evening of the second day by a moderate flow lasting for two or three days. After this the girl's general health improved, and the flow appeared the following month just as previous to the commencement of the lung-trouble. Subsequently, however, she failed rapidly and died in about two months. Encouraged in this removal of the amenorrhœa by this drug, Dr. Bidwell's partner, Dr. Brock, prescribed 2-grain capsules of the permanganate for a young lady, unmarried, 22 years of age and somewhat debilitated, who had been suffering from amenorrhœa for four or five months. After the first dose she complained of severe burning pain from the throat to the pit of the stomach, was nauseated, pulse rapid and rather weak. This was supposed to be due to some irritating article of diet, and the patient drank a quantity of milk, which eased the pain somewhat. The next morning when she took the second capsule there was a repetition of the symptoms of the previous evening, only more severe. The patient was intensely nauseated and vomited, complained of intolerable burning in the stomach and throat, was almost pulseless, completely prostrated, and did not fully recover for two or three days.

Subsequently, in the case of another young lady, unmarried, and about the same age and condition of health, who had suffered from suppression of the menses for two months, he prescribed 1-grain capsules with the same result, pain like a flaming fire in the stomach and throat and generally symptoms of shock and collapse.

THE VALUE OF BORIC ACID IN VARIOUS CONDITIONS OF THE MOUTH.

Boric acid is now officinal, and justly so. It has long been used in various metallurgical and ceramic operations, and more recently its preservative power has been abundantly demonstrated. It is this antiseptic power which gives it its great therapeutic value. It is a very stable compound—one of the most stable of the acids; it is not volatile, and only exerts its action when in solution; fortunately, however, it is soluble in more than one menstruum. Up till now, its chief application has been in connection with modern surgery, where the boric ointment, lint, and lotions all hold a prominent place.

There are, however, also spheres of usefulness for it in medicine, and Dr. A. D. Macgregor (*Brit. Med. Jour.*, July 11, 1886) calls attention to the fact that it is especially valuable in the treatment of diseases of the mouth. It is the benefit of its local action we usually wish to gain, for, though sometimes given internally,—as in irritable conditions of the bladder,—its topical antiseptic effect is more often desired. In connection with its local application in various diseased conditions of the mouth, its solubility in water and glycerin, its unirritating character, its comparatively innocuous nature, and its almost tastelessness, are greatly in its favor. More particularly is this the case in treating such conditions in children, whose oral cavities cause them so much annoyance. Speaking generally, boric acid will be found useful in all conditions of the mouth, fauces, pharynx, and nose, where there is any abrasion of the epithelium; whether it be used as a powder, gargle, mouth-wash, pigment, or confection. More definitely, it is not contra-indicated in any of the forms of *stomatitis*, though scarcely severe enough for the graver varieties.

In *simple catarrhal stomatitis*, a mouth-wash, containing from 10 to 15 grains to the fluid ounce, speedily cures the condition, and exercises the same beneficial influence in the *ulcerative* form, though there, in addition to the rinsing of the mouth, a local application, in the form of the powder or pigment, should be made to the individual follicular ulcers.

The powder simply consists of finely-powdered boric acid, mixed in various proportions with starch; the pigment is a solution of boric acid in glycerin (1 in 4 or 5). In both cases, the addition of chlorate of potassium is advantageous; indeed, Mr. Macgregor usually combines it, but it is not essential.

Nothing, according to Dr. Macgregor, is at once so rapid and so efficient, in the treatment of *parasitic stomatitis* or *thrush*, as this remedy. The youngest children do not object to its application. The *oïdium albicans* quickly succumbs to its influence. For thrush in children, he especially recommends boric acid, either as a mouth-pigment or as a confection. Honey and sugar have both been condemned as being inadmissable, in combination, for the treatment of thrush; but, so far as children are concerned, Dr. Macgregor considers a confection (though made with honey), which has been impregnated with boric acid, gains more by its palatableness than it loses by the tendency of the saccharine matter to further the growth of the fungus. The boric acid at once does away with this tendency. Let the pigment be frequently painted with a brush over the patches, never omitting to do it after food has been taken; or, a little of the confection, simply allowed to dissolve in the mouth; and the days of the fungus will soon be ended. He has found boric acid, combined with its salt (borax), markedly beneficial. Borax alone, however, is not nearly so good.

In *pharyngitis* and *relaxed conditions of the throat*, a gargle, containing boric acid and glycerin, with either tannic acid or alum in addition, ought not to be forgotten.

Dr. Macgregor has also found combinations of this substance helpful and grateful to the patient in the condition in which we frequently find the mouth, tongue, and teeth in severe cases of typhoid fever. The mouth is hot; the lips dry, cracked, and glued to the sordes-covered teeth by inspissated mucus and saliva; the tongue dry, or even glazed and hard, brown or black, crusted with a fœtid fur. Under such circumstances, a pigment, containing boric acid (30 grains), chlorate of potassium (20 grains), lemon-juice (5 fluid drachms), and glycerin (3 fluid drachms), yields very comforting results. When the teeth are well rubbed with this, the sordes quickly and easily become detached; little harm will follow from the acid present. The boric acid attacks the masses of bacilli and bacteria; the chlorate of potassium cools and soothes the mucous membrane; the glycerin and lemon-juice moisten the parts and aid the salivary secretion.

So much for the soft parts; a word in conclusion regarding the teeth. Few medical men have ever given a prescription for a tooth-powder (such a matter is beneath their notice), and the selection of the ingredients for the various powders and pastes in vogue for the purpose of beautifying and cleansing the teeth is left entirely in the hands of those who certainly should not know better than medical men.

A tooth-powder should possess certain characteristics; it should be antiseptic, cooling, agreeable to taste and smell, and have no injurious action on the teeth. After use, it should leave the teeth white, and a sensation of freshness and cleanliness in the mouth. As an antiseptic in this connection, nothing can displace boric acid. For years Mr. Macgregor states that he has used the following powder, and can recommend it: Boric acid, finely powdered, 40 grains; chlorate of potassium, ℥ss; powdered guaiacum, 20 grains; prepared chalk, ℥i; powdered carbonate of magnesia, to ℥i; otto of roses, half a drop. The boric acid in solution gets between the teeth and the edges of the gums, and there it discharges its antiseptic functions; the chlorate and guaiacum contribute their quota to the benefit of the gums and mucous membrane generally; the chalk is the insoluble powder to detach the particles of tartar which may be present, and the magnesia the more soluble soft powder which cannot harm the softest enamel.

CRUSHING THE GRANULATIONS IN TRACHOMA.

Dr. Kramsztyk, writing in the *Gazeta Lekarski*, advises a method of treating granular lids or trachoma which was proposed by Dr. Wicherkiewicz, and which consists of a forcible crushing of the granulations. The eyelid is everted and held by an assistant, and is then subjected to pressure between the two thumb-nails, the operator moving his thumbs to and fro so as to act on as much of the eyelid as possible. Where the granulations cannot be reached in this way, such as those situated at the canthi and on the plica semilunaris, they are pricked with a needle, and then crushed by means of a pair of forceps or some other suitable instrument. The operation is very painful, and cocaine seems to be of little use. Under chloroform, the whole of the granulations can be crushed at

a single sitting. Otherwise the length of time and the number of sittings required to effect a cure depend on the abundance of the granulations and the patient's power of endurance. Where other disease of the conjunctiva exists, it must of course be attended to, and different measures adopted. The after-treatment consists in the prolonged application of cold-water dressings to the eye.—*Lancet*, August 14, 1886.

COCAINE IN CATARACT EXTRACTION.

In the *Journal of the American Medical Association* (August 21, 1886), Dr. George E. Frothingham publishes some cases illustrating the safety of cocaine as an anæsthetic in cataract extraction, and summarizes his conclusions as follows:

1. Cocaine relieves the operator from the embarrassments during the operation for cataract that arise from vomiting; also from the agitation of his patient which results from excessive bronchial secretion, or stertorous breathing. These are often very troublesome when ether or chloroform is used.

2. The danger to the result which often arises from nausea and vomiting after the extraction, when other anæsthetics are employed, is very surely avoided when cocaine is selected as the anæsthetic agent and is properly used.

3. The danger arising from the depressing effect of cocaine upon the nutrition of the cornea is no greater than in cases where ether or chloroform are used. The depression of the circulation, which often arises from either of them, may affect very injuriously the corneal nutrition.

4. The disturbance of the circulation of the interior of the eye, and consequent danger of panophthalmitis from this cause, is probably less in using cocaine for this operation than in resorting to general anæsthesia.

5. The danger of sepsis and consequent panophthalmitis from the use of cocaine may be avoided by using only fresh solutions.—August 7, 1886.

ARBUTIN.

Dr. Borisoff, of St. Petersburg, having recently examined "the pharmacological action of arbutin, a glucoside obtained from the leaves of the Uva ursi," by means of experiments on dogs and frogs, finds that it has a decided diuretic effect, due to stimulation of the epithelium of the Malpighian bodies and urinary tubules of the kidney, and to increase circulation of blood through the kidneys. Though large doses of arbutin exercise a paralyzing effect on the brain of the frog, little general disturbance is caused by the drug in warm-blooded animals, even if given in considerable doses. It exercises a distinct antiseptic influence in lessening the formation of pus in cases of purulent inflammation of the bladder and kidney. Dr. Borisoff thinks this drug may be found of much use in practice. He would give larger doses than those which have been suggested by some writers, —*e.g.*, M. Levine. He would commence with from 1 to 2 grms. (15 to 30 grains), given several times a day in powder, or dissolved in water. He has made a diligent search through the scientific journals of all nations for the literature of the subject, and has collected no less than forty-three different articles, mostly from German sources, but with a few American and Russian exceptions.—*Lancet*, July 24, 1886.

POISONING WITH THE BALSAM OF INDIAN HEMP.

Dr. Seifert, of the Würzburg University, publishes in the *Münch. Med. Woch.*, xxxiii. 20, p. 347, 1886, the following history of an intoxication produced by the balsam of cannabis indica.

A physician of Würzburg having noted cephalalgia, coma, and palpitation of the heart in a lady after the ingestion of the above preparation, took, for the sake of experiment, after breakfast a pill containing 0.1 grm. (1½ grs.) of the balsam. cannab. indicæ (Denzel), which has been recommended as a prompt and safe hypnotic. Half an hour later a state of excitation set in which led to frightful mental and physical exertions. The physician felt convinced that he soon had to die and could only be held by the greatest efforts of his surrounding friends. Painful muscular contraction set in, the cardiac action was weak but excited, the pupils dilated and with a sluggish reaction to light. Two days elapsed before the physician regained his prior state of health.

Seifert warns his fellow-practitioners against employing the balsam, and claims that the extract of cannabis indica, in Vienna at least, is justly regarded as an unreliable and dangerous preparation.

The extract of cannabis indica, especially the fluid preparation, as sold in the American market is not known as dangerous and unreliable, and, we may say, is rather a popular remedy with many American practitioners.

THE MURMURS OF THE MITRAL AREA.

At a recent meeting of the Academy of Medicine in Ireland, Dr. C. J. Nixon read a communication on cardiac murmurs of the mitral area (*British Med. Journ.*, August 7, 1886.) He referred to five varieties of mitral murmurs met with: (1) presystolic murmur; (2) postdiastolic murmur; (3) organic systolic murmur; (4) functional systolic or postsystolic murmur; (5) mitral *bruit de scie*. In discussing presystolic and postdiastolic murmurs, attention was directed to the acoustic character of the murmurs, the conditions with which they were associated, and the signs which might simulate them. Presystolic murmur might occur with: (*a*) a sharp clicking first sound; (*b*) a systolic murmur of mitral reflex; (*c*) partial or complete extinction of the aortic second sound; (*d*) a postdiastolic murmur. Postdiastolic murmur was a sign of an extreme amount of stenosis of the mitral area, and, judging from the chronometric position of the murmur, the term postdiastolic was more correct than diastolic. Having discussed the stages of mitral stenosis, as determined by the development of different physical signs, the subject of mitral regurgitant murmurs was next considered. In dealing with the systolic murmur of organic disease, a reference was made to Naunyn's murmur, which was regarded as an instance of a murmur produced by convection, owing to the peculiarities of change in structure of the mitral segments, just as Dr. Sansom had pointed out that organic changes in the mitral orifice might lead to a presystolic murmur being best heard over the tricuspid instead of over the mitral area. The systolic murmur heard over the situation of the left auricular appendix, in cases of chlorosis and such allied conditions, was not, as Dr. Balfour held, a murmur of mitral reflux, but a murmur developed in a displaced pulmonary artery. Systolic mitral murmur was developed in cases of hypertrophy of the left ventricle, associated with Bright's disease, without any organic change in the auriculo-ventricular valve; and it likewise was met with in cases of extreme dilatation of the left ventricle, as in a weak and dilated heart, and in cases of long-standing aortic incompetency. In such cases, the inadequacy of the mitral valve was due either to overstretching of the auriculo-ventricular zona tendinosa, or to a relative shortening of the papillary muscles, in consequence of the dilatation of the cavity of the ventricle. Systolic mitral murmur, of purely functional origin, was next taken into consideration, and the conditions under which it is met with, and the special characteristics of the murmur, were dwelt upon. Dr. Nixon specially referred to the theory urged by Dr. Bramwell, to explain the occurrence of this murmur in connection with a peculiar arrangement of the muscular fibres of the heart, surrounding the auriculo-ventricular ring, constituting what was termed a muscular sphincter. The murmur was held to be produced by want of tone in the muscular fibres of the ventricle, and of the sphincter muscle, allowing such a dilatation of the orifice as to render the valves incompetent. Dr. Nixon showed that this view was incorrect, as the arrangement of the muscular structure of the heart, upon which it was based, did not exist. After alluding to certain conditions in the lung which might simulate a systolic mitral murmur, a brief reference was made to the existence of a mitral *bruit de scie*, met with in cases of aneurism of the heart, or where an abnormal communication existed between the aorta or pulmonary artery and one of the ventricles.

CONCEPTION OF MALE CHILDREN AT THE TIME OF THE POST-MENSTRUAL ANÆMIA.

Dr. Camillo Fürst, of Graz, publishes in the *Archiv für Gynæcologie*, 1886, xxviii. 1, p. 14, a contribution to the interesting and frequently-discussed question, When and how is the sex of the conception-product determined? In the first section of the paper, which treats of "the time and causes of the determination of the sex in general," Fürst proposes certain maxims which, though not new, will interest our readers. According to the author we find a surplus of male conceptions in the working classes and country inhabitants as compared with the well-to-do people and the inhabitants of cities. Likewise, we can look for the surplus of male infants during hard times and the concomitant rise of food-prices, and before the ultimate extinction of a race. If a deficient nutrition of the procreators produces a surplus of male children, our author continues to argue, we can be certain that also the state of nutrition of the fecundated ovum, especially shortly after conception, will influence the sexual differentiation. And as after menstruation the vessels of the genital organs assume an ischæmatous character,—forming the so-called post-menstrual anæmia,—Fürst concludes that conceptions taking place

immediately or shortly after menstruation will give a surplus of males on account of a relatively bad nutrition of the fecundated ovum. To strengthen his theory the author utilizes the statements of women confined in maternities, who mostly with an astonishing certainty could remember the end of the last menstruation and the day of conception. The statistics of the mentioned institutions show a very considerable surplus of male children for the first four or five days following menstruation, and a surplus of female ones for the succeeding period.

A NEW VAGINAL IRRIGATOR.

The many inconveniences which attend the methods employed in private practice for administering vaginal irrigation are so objectionable that in many instances they are an absolute bar to the continuation of the process; this is largely due to the cumbersome character of the necessary apparatus. Dr. John W. Gordon, in the *Medical Record*, July 10, 1886, describes, however, an instrument which will do much to simplify the application of this process, and correspondingly increase its efficiency. The instrument consists of an injection-tube, which may be attached to, and operated by, all kinds of syringes—the ordinary rubber-bulb, alpha, fountain, or hydrant. This injection-tube is surrounded—a portion of its length—by a larger tube, which supplies means of ample drainage. Surrounding the intra-vaginal portion of the drainage-tube, and attached thereto, is a hollow, soft rubber bulb or tampon, conical in form, elastic and compressible, which, when the instrument is inserted within the vagina, gently and perfectly occludes the orifice of that canal, thus preventing the surplus injection fluid from escaping therefrom otherwise than through the drainage-tube, which communicates with a receptacle which is placed on the floor at the side of the bed or couch.

Thus, while this elastic and compressible tampon affords absolute immunity from leakage, it also, by means of the enclosed air-chamber, protects the sensitive vulva and perineum from undue contact with heat, thereby enabling the patient to make use of injection fluids at the highest requisite degree of temperature with entire impunity during the most lengthened period of irrigation.

Patients—without the aid or presence of an attendant—conveniently and willingly operate the instrument in an efficient manner while occupying every variety of the recumbent position; indeed, all desirable postures are equally available, and no accessories whatever are required.

By virtue of the peculiar mechanism of this device and the simplicity of its operation the user easily controls the mechanical action of the injection fluids employed. Thus by simply compressing the drainage-tube between the finger and the exterior of the ring by which the instrument is held in place—thereby obstructing the outflow—the vaginal canal may, whenever advisable, be distended to the fullest extent by the gentle means of equable hydrostatic pressure, by which manœuvre the rugæ are thoroughly separated and the irrigating liquid finds direct access to the entire mucous surface of that organ, and may be thus retained indefinitely; while by means of the dependent position of the drainage-tube the injection fluid—obeying the fundamental law of hydraulics—wholly escapes from the vagina ere the instrument is withdrawn from its position at the termination of each period of irrigation; and hence, whatever the posture of the patient, and whatever the properties of the liquid used, perfect cleanliness of person and the avoidance of wetting or soiling clothing or bedding is insured from first to last.

The smallness of the apex of the tampon—five-eighths of an inch in diameter—renders the device no less available to the maid than matron.

THE INSUFFLATION OF IODOFORM INTO THE TRACHEA AFTER TRACHEOTOMY FOR DIPHTHERIA.

Were it not for the fact that after tracheotomy for diphtheria in children death is extremely common from the spread of the membrane down the trachea, the operation would be much more popular than it is at present. It is usually simple and successful enough as an operation, but the continuation of the disease in the trachea renders the final results far from satisfactory. After losing several cases from the above cause, it occurred to Mr. George Shirres (*Lancet*, July 24, 1886) that the insufflation of iodoform into the trachea after the opening of the windpipe might do something towards preventing the appearance of membrane there, and might thereby lessen the probability of death.

The experiment proved eminently successful in two cases of which Mr. Shirres publishes full notes. In the first of these cases, that of a boy aged 4½ years, tracheotomy was

performed under clear indications, and two hours after the operation the inner tube was removed and a thin insufflator passed down the outer one and about 10 grains of iodoform blown down the trachea. The child had a slight paroxysm of coughing, and, to judge from the expression of his face, seemed to have experienced a rather unpleasant sensation, but there was no other result. The insufflation was repeated every four hours. The next morning the tube was found comparatively clear, but the temperature was 102½°. Being rather afraid of iodoform poisoning, Mr. Shirres stopped the insufflation, but during the day the tube got frequently clogged with membrane and had to be removed and cleaned every two or three hours. At night the insufflation was renewed and repeated every three hours with excellent effect. During the night the external tube was accidentally removed, and when summoned to the patient, Mr. Shirres found him in great distress, breathing through the wound with considerable effort. The tube was reinserted with some difficulty, and from that time the patient rapidly recovered and the tube was permanently removed on the fifth day. According to Mr. Shirres, the best time to insufflate is just after the act of inspiration. When the iodoform is insufflated into the trachea the cilia on the mucous surfaces carry the particles of iodoform upward as far as the larynx, when they are removed with the mucus through the tracheotomy tube.

ON THE INFLUENCE OF ANTIPYRIN ON THE ELIMINATION OF NITROGENOUS MATTERS.

The steadily-increasing utilization of antipyrin as a prompt, convenient, and innocuous antipyretic has naturally stimulated researches as to the physiological aspects of the drug. Among these the influence which this drug exercises on the tissue-changes invites, of course, our special interest.

UMBACH's experimental studies, executed in V. Nencki's laboratory at Berne, and reported in the *Archiv für experimentelle Pathologie und Pharmakologie*, vol. xxi., Nos. 2, 3, 1886, are well adapted to enlighten us in regard to the subject in question. Umbach made the observations pertaining to the elimination of nitrogen and uric acid on his own person, in order to obtain very reliable results. By rigorous dietetic measures the observer succeeded in establishing a certain normal figure for the elimination of nitrogeneous matters, with but slight daily variations (1 dr. *pro die* at the utmost). Uric acid was determined by precipitation with muriatic acid, and the total value of the eliminated nitrogeneous matters was obtained by Kieldahl's process, as modified by Petri. After ten so-called normal days Umbach took on two consecutive days 1 dr. of antipyrin each, and noted soon a general excitation, insomnia, and a peculiar burning sensation of the skin. The minimum of the bodily temperature was 36.1° C. (a reduction of 1.4° C.), and the frequency of the pulse decreased about fourteen beats per minute. It was ascertained that antipyrin, while not altering the elimination of uric acid, caused a reduction of thirty grains (corresponding to one drachm of urea) in the figures representing the total of the eliminated nitrogeneous matters.

A second series of observations instituted on his own body furnishing quite analogous results, Umbach felt safe in announcing the following axiom: "Antipyrin, like quinine and other antipyretics, materially lessens the elimination of nitrogeneous matters, and can therefore be said to cause a decrease in the tissue-changes of the respiratory and alimentary systems."

While antipyrin was thus shown to reduce the tissue-changes, it was proven by similar experiments that the sulphates (sulphide of calcium) cause an increase in the total of eliminated nitrogeneous matters, with a simultaneous decrease of uric acid. Umbach explains this influence of alkaline salts—as in the case of carbonates—as resulting from the increased alkalescence of the juices, and the thus heightened oxidation processes in the body.

An investigation of the influence of antipyrin in fever patients instituted by Wiczkowski, led to very similar results. This observer also noted a considerable diminution of the chlorides in the urine in the apyrexia produced by antipyrin, even if a sufficient amount of chloride of sodium be ingested.

THE TREATMENT OF A FORM OF DIARRHŒA IN CHILDREN.

There is a form of diarrhœa in children, usually occurring after weaning, and from that period to four or five years of age, which is characterized by the most horrible offensiveness of the motions. This is so marked that it is generally at once mentioned by the parents. It is commonly met with in summer, but is not strictly what is known as

infantile diarrhœa, in which disease the stools are sour, but not necessarily fœtid. Probably this form of diarrhœa differs from the diarrhœa of younger infants in being caused by the growth of the ordinary bacteria of putrefaction. It is not amenable to treatment by any astringent, nor has any alteration of diet much effect upon it.

Dr. James Braithwaite (*Brit. Med. Journ.*, July 17, 1886), however, thinks that it may be successfully treated by disinfecting the bowel contents by means of salicylate of iron, as in the following prescription, which is suitable for a child two years of age: Sulphate of iron, ℈i; salicylate of sodium, ℈i; glycerin, ʒiij; water to three ounces. The iron and the salicylate should be dissolved separately, and the solutions mixed. The color is darker than port wine, and the taste not unpleasant. One teaspoonful must be given every hour, until the stools become well blackened, which happens in about twenty-four hours; or a larger dose may be administered at longer intervals. The medicine should then be given every three or four hours, and occasionally a small dose of castor-oil, to clear the bowels well out, and to get the secondary constipating effect of the oil.

In hospital practice, and amongst the poor, it is not so successful as it would be if it were possible to remove the child from the family living-room, the air of which is usually very impure, and is made worse by the smells incidental to cooking, and the presence of a sink.

AN EXPERIMENTAL STUDY OF THE TOXIC AND PHYSIOLOGICAL EFFECTS OF THE SALTS OF TIN.

From the study of Dr. Patenko, of St. Petersburg, relating to the action of the salts of tin, as published in the *Arch. de Physiologie*, vol. xvii., No. 1, 1886, we condense some points of general interest. The experiments made by the observer with the salts of tin on frogs, dogs, and guinea-pigs, appear essentially only to confirm what Orfila had long ago said of this metal,—viz., that it could never be used for pharmacological purposes. Patenko even doubts the vaunted anthelmintic action of metallic tin, for he found tæniæ and living ascarides in the intestinal tract of dogs which had received large quantities of tin in powder form.

The effects caused by subcutaneous injections of chloride of tin are merely to be ascribed to the caustic influence of the drug. If the latter is introduced directly into the veins of dogs in a quantity of 1 to 2 cg. ($\frac{1.5}{100}$ to $\frac{3}{10}$ gr.) no reaction ensues. If, however, 5 cg. ($\frac{8}{4}$ gr.) are being employed, death sets in after general trembling, tetanic convulsions, Cheyne-Stokes breathing, and opisthotonus. A post-mortem examination of the brain always shows hyperæmia, cloudy nerve-cells, with invisible nuclei and numerous ecchymoses.

Seven grains of the salt given to the dogs internally did not produce any effects at all; 15 grains caused simply indigestion and temporary vomiting.

In the experiments made on frogs it was observed that the anæsthesia which set in fifteen minutes after the subcutaneous injection of tin into the plantar region of the foot limited itself to the foot and the lower part of the thigh without ever attacking the upper one. Control experiments, consisting in the injection of simple water, showed the exclusion of mere mechanical causes in the stated phenomenon. The motility of the part remained always intact, and the animals died later of gangrene.

POISONING BY BISULPHIDE OF CARBON.

Poisoning by bisulphide of carbon is so rare that the following case reported by Mr. William Foreman (*Lancet*, July 17, 1886) may be deemed of some interest. The case was that of a man, aged 63, who had swallowed probably about half an ounce of bisulphide of carbon with suicidal intent. When seen by Mr. Foreman a quarter of an hour after his having taken the poison he was sensible, but refused to give any information. There was a strong smell of bisulphide of carbon in the room. A tablespoon of mustard with 6 ounces of warm water was at once administered, and 40 grains of sulphide of zinc directed to be taken in warm water if the mustard did not act, while afterwards 15 grains each of bicarbonate of sodium and carbonate of magnesium every 10 minutes were ordered. Half an hour later he was completely unconscious, and could not be roused, and as he had not vomited, the stomach-pump was introduced, but only a small quantity of brown-colored liquid removed. The stomach was washed out with warm water; the pupils were normal, but reacted to light; conjunctiva suffused and insensible to the touch; respiration slow and stertorous; pulse rapid, compressible, varying from 150 to 160 per minute; surface of body cold and clammy; tongue thick and furred. Two tablespoons of brandy in half

a glass of water were given through the stomach-pump, but he never rallied, and died two hours after taking the poison. At the post-mortem examination, which occurred twenty hours after death, the following appearances were noted: Rigor mortis complete; pupils normal; hypostatic congestion of dorsum; body well nourished. On opening the head the dura mater was adherent to the calvaria; surface of the brain much congested; veins gorged with black blood. Brain substance healthy. Thorax: The left lung was slightly adherent at the apex; no effusion in the pleural cavities; lungs healthy. Heart: The right ventricle contained about an ounce of dark fluid blood; walls covered externally with a layer of fat; left ventricle firmly contracted and empty. Abdomen: The stomach contained about a quarter of a pint of fluid, with flakes of lymph in it, slightly ropy, and appeared to be water and mucus. A faint smell of bisulphide of carbon was perceptible. The submucous tissue was injected, and there was a number of minute hemorrhages. The posterior wall of the stomach was much more congested (to the size of a crown-piece) than the anterior surface. There was no perforation or abrasion of mucous membrane. The spleen was small, but healthy. The liver was normal in size, and healthy. The kidneys were surrounded with a large quantity of fat; they were slightly congested, but healthy. The bladder contained about two ounces of urine, having a slight smell of bisulphide of carbon. There was less of the cadaveric smell than is usual in post-mortem cases.

SALICYLATE OF COCAINE IN ASTHMA.

A comparatively new method of treatment in asthma nervosum has lately been tried by PROFESSOR MOSLER, of Greifswald. It is now well known that cocaine has not only a local action on the sensory nerve-endings, but also a central one, which, at first stimulating to the nerve-centres, may, if the drug be pushed, become sedative or even narcotic. By this peripheral or central effect, it may, therefore, act in such spasmodic diseases as asthma. Early last year, Beschorner published two cases of this disease which were much benefited by cocaine. In three cases, Professor Mosler has obtained excellent results. All these cases occurred in young people of 23 to 25 years of age, and were uncomplicated by any organic heart- or lung-disease. The drug was given subcutaneously, in doses of 0.4 gramme (6 grs; this seems an exceptionally large and dangerous dose), at the commencement of the attack. The first patient, who had a bad family history as regards lung-disease, and in whom the asthma had lasted eleven years, was relieved after the third injection; two more doses caused abeyance of the attacks (which occurred previously every day) for a fortnight, when the patient was lost sight of. In the second and third cases, the treatment was more rapid in cutting short the attacks, which in the end were postponed for three or four weeks, during which the patients continued under observation. The injections caused, in one case, a slight sense of faintness and the appearance of dark spots before the eyes; but these symptoms soon vanished. It is, of course, impossible to draw from these cases any conclusion as to the permanent benefit of the treatment. Extended experience will perhaps show that the drug is only a palliative. It is in the hope of inducing other practitioners to try the treatment that Professor Mosler has published the results of his cases.—*British Med. Journ.*, July 17, 1886.

ADENOMA OF THE PLACENTA.

The affections of the placenta have not yet received the degree of attention to which, on account of the relations they often entertain with abortion or the progress of confinement, they are fairly entitled. Quite recently DR. KLOTZ, of Innsbruck, showed in a valuable paper appearing in the *Archiv für Gynæcologie*, that the placenta is liable to an affection which has hitherto been never observed, viz., the adenoma. The following theses embody the principal conclusions of Dr. Klotz's paper:

1. There exists a true adenoma of the placenta starting from the spongy portion,—*i.e.*, from the ectatic gland-spaces of the decidua serotina.

2. The formation of the adenoma begins with the gradual fusion of the cells of the decidua into an homogeneous protoplasmic mass resembling embryonic connective tissue and having a nucleus; besides, the glandular epithelium is reduced to a tissue of its own, from which new epithelial cells are formed.

3. The fusion mass grows by budding of its connective-tissue constituents; hence the adenoma of the placenta belongs to the connective-tissue tumors.

4. The adenoma of the placenta is liable to return after removal, unless powerfully cauterized.

5. Death and expulsion of the fœtus are consequences of the adenoma.

6. The placenta is retained for weeks and months; its spontaneous expulsion is probably impossible.

7. Klotz observed three cases of adenoma of the placenta, in none of which (after an expiration of five years) a return was witnessed. All three women enjoy at present perfect health, but of course conceive no longer.

ELECTROLYSIS FOR THE TREATMENT OF URETHRAL STRICTURE.

At a recent meeting of the Academy of Medicine in Ireland, MR. P. J. HAYES read a paper on the treatment of urethral stricture by electrolysis, the comparatively novel method practised by Drs. Robert Newman, of New York, and S. T. Anderson, of Bloomington. He gave the details of three cases, in which he had himself adopted the method with encouraging results (*British Med. Journ.*, July 17, 1886). He strongly advocated the trial of electrolysis, even for the most complicated forms of stricture. It did not at all interfere with the subsequent employment of other measures, minor or serious. Electrolysis was best adapted for the treatment of annular strictures rather limited in length. Having ascertained the situation of the stricture, the tip or exposed metal bulb of an electrode ought, if possible, to be lodged within it; or, if this was impracticable, the tip must be in close contact with the anterior face of the stricture. Then a small galvanic battery was connected by its negative pole with the urethral electrode, while the positive might be attached either to a moist sponge electrode, or, better still, to a thin metal plate covered with moistened chamois-leather. The positive electrode would be advantageously applied either to the patient's perinæum, or against the inner side of one thigh. As to the strength of the current to be employed, the patient's own sensations would prove the best guide. The current should be perceived, but it ought not to be pushed to cause pain, nor should the surgeon attempt more than it was needful to effect at each sitting, using only mild currents, and manipulating the electrode with gentleness, and never pushing it through the stricture, as it accomplished more by being allowed to remain in the stricture than by being caused to quickly traverse it. The sittings might be repeated every ten days, if desired. Cauterizing would be produced when strong currents were employed; but, with mild currents, the gradual breaking up of fibroid tissue was effected by a combination of chemical decomposition and vital absorption until but a thin lamella of cicatricial tissue remained to mark the seat of the stricture.

INHALATIONS OF PURE CARBOLIC ACID IN WHOOPING-COUGH.

Though the benefits derived from the inhalation of carbolic acid in the treatment of diphtheria and pertussis have long been well understood by practitioners, the exhibition of sufficiently strong solutions of carbolic acid have nevertheless been omitted in view of the great sensitiveness of children against this drug. As we learn from the *Deutsche Medicinische Wochenschrift*, 1886, xii. 21, DR. PICK, of Coblenz, has treated a number of children affected with whooping-cough by fixing an inhalation-mask in front of the mouth and nose and pouring into a piece of cotton in the interior of the mask, 15 to 20 drops of pure (liquefied) carbolic acid. The mask has to be worn, if possible, the entire day, but at least for six to eight hours, and the cotton is to be renewed three times daily. A careful investigation of the urine will give a timely warning of the danger of an intoxication.

In the cases treated by Pick the results were entirely satisfactory, so that he feels justified in recommending these inhalations as an efficient means to combat the affection.

THE USES OF HOT WATER IN SOME OF THE CORNEAL AND CONJUNCTIVAL INFLAMMATIONS.

The above is the title of a paper read by DR. B. E. FRYER, of Kansas City, before the recent meeting of the American Ophthalmological Society (*New York Med. Journ.*, August 14, 1886). In this plan of treatment water was used at as high a temperature as could be borne. After a few hours, a temperature of 140° F. could be tolerated. The water should not be cooler than this, but as much hotter as the patient could endure. A method of using it was by fomentation with a napkin dipped into the hot water and (not wrung out) applied to the closed eyelids. This was continued for half an hour at a time, and repeated every one, two, or three hours, day and night. It might also be applied by suspending a vessel above the patient and allowing the water to escape through a tube, thus

keeping up a continuous action. In some cases the temperature might be raised almost to the boiling point. During the intervals between the applications, a cloth wrung out of the hot water was allowed to remain over the eyes. In some cases of purulent ophthalmia the hot water might be thrown into the conjunctival sac. In purulent conjunctivitis this application cut short the attack more quickly and safely than the use of ice-cold water. In gonorrhœal ophthalmia it quickly lessened the swelling and diminished the tendency to ulceration of the cornea. If ulceration had begun, it was less likely to progress, and the amount of cicatricial tissue was lessened. In these cases the author occasionally used instillations of sublimate solution or finely-powdered iodoform. In catarrhal and phlyctenular ophthalmia it was a good adjuvant. In acute and chronic keratitis it was useful. Its most marked effects were seen in cases of corneal ulcer. The small amount of opaque tissue left was astonishing. The pain and photophobia were also diminished.

Dr. Samuel Theobald, of Baltimore, had not used hot water in purulent troubles, but in interstitial and specific keratitis its use had been beneficial, and he thought it favored absorption of the opacity.

THE RELATIVE VALUE OF VARIOUS DISINFECTING AGENTS.

The infection of a wound during an operation springs either from its contact with hands not freed from micro-organisms, instruments, sponges, etc., or from the entrance of bacteria from the non-sterile atmosphere of the operating-room. The former source of infection is by far the more important one.

In order to experimentally ascertain the relative value of the most popular disinfecting agents, Dr. Kümmel, of Hamburg, brought sponges, instruments, and other utensils of the operating-room in contact with Koch's gelatin-plates, and noted the number of subsequently formed colonies after using the various modes of disinfection (*Archiv für Klin. Chirurgie*, 1886, xxxiii. 3, p. 531).

Kümmel noted very essential differences between the cases in which the disinfection had been preceded by washes with potassium soap and those in which this precaution had not been taken.

Instruments taken from a cupboard, in which they had remained for some time, but free from every visible soiling, could not be sterilized by an immersion into a five per cent. solution of carbolic acid, lasting two minutes. A contact of ten minutes with the solution, however, sufficed to kill all germs.

Other antiseptic agents, such as the sublimate soap, gave still less favorable results. The one per cent. Hg soap did not produce any reliable sterilization in fifteen minutes.

On the other hand, knives used in the dissecting-room and exceedingly soiled were rendered almost completely sterile by simply washing them with water and potassium soap. Complete sterilization could invariably be looked for by an immersion into a five per cent. solution of carbolic acid after the preceding use of the potassium soap. The same held true of sponges: disinfection without the preceding use of the potassium soap was uncertain and required ample time, while following its use it was both reliable and quick. The hands presented greater difficulties to a complete sterilization than either knives or sponges. Potassium soap and a five per cent. solution of carbolic acid by far excelled, also a one per cent. sublimate solution.

Kümmel also endeavored to sterilize the air of a room before and during an operation, but, as could be expected, failed completely. A spray being in action for some time did not even diminish the number of germs in existence, and only after the apparatus had ceased to work, the colonies were noted to have somewhat decreased. Very good results were obtained by thoroughly washing the walls and all the furniture in the room.

CACUR, A KAFFIR EMETIC.

The extensive use of emetics in the treatment of disease by the Kaffirs of South Africa is well known by dwellers with or travellers among these races.

One of their most frequently-employed emetics is a green or yellowish-green fruit known as cacur, cacuo, or small bitter apple. The plan of administration pursued by the Kaffirs is to heat the fruit, squirt out the contents into their mouths, and swallow the material thus expelled. In a quarter of an hour or thereabouts emesis then occurs. Two of the pepoes are so administered in the case of an adult; one in the case of a child. The plant grows largely in gardens as a weed, especially where melons and pumpkins are cultivated. When ripe, it is quite yellow, but is used by the natives when green or greenish-yellow. The plant is obviously one of the *Cucurbitaceæ*, and has been pronounced by

Prof. Oliver to be the *Cucumis myriocarpus*. The plant produces fruit very abundantly,—subglobose pepoes, about the size of a large gooseberry, green when unripe, yellow when mature, and beset somewhat sparingly with short soft prickles. Each pepo weighs from 60 to 100 grains, and on section presents three parietal placentæ, with numerous seeds embedded in a soft viscid pulp, which becomes much more fluid when warmed,—possibly the object of the heating practised by the Kaffirs. The pulp has a faint cucumber-like odor, and is decidedly but not intensely bitter. The rind is soft, and can only be peeled off with considerable difficulty; it, too, is somewhat bitter, but much less so than the pulp. The testa of the seeds, which are exalbuminous, have a feebly-bitter taste; the seed otherwise is tasteless. The plant, apart from the pepoes, seems inactive.

Mr. G. Armstrong Atkinson obtained a specimen for investigation, and publishes the results of his study in the *Edinburgh Medical Journal*, July, 1886.

To test its action he took, on an empty stomach, 20 grains of the fresh pulp, and in about half an hour felt somewhat nauseated, but was not sick. Four or five hours afterwards he had some griping pains, and two or three hours after this was slightly purged. To a large fasting dog he administered, bruised with water, a pepo weighing 69 grains. No sickness was produced, and the dog seemed generally unaffected. In about eight or nine hours very watery diarrhœa occurred, which lasted for well on to twenty-four hours, the evacuations being bilious-looking, and containing much mucus. Some days later two pepoes, weighing together 118 grains, were administered in a similar manner, and in twenty minutes very free emesis occurred, the dog vomiting several times, the last vomit containing a little blood. Considerable salivation was also produced at the same time. After the vomiting ceased the animal rapidly returned to its normal condition, and no purgation followed.

From these brief notes it will be seen that the action of the drug is that of an emetic and of a cholagogue purgative; purgative in non-emetic doses, and in doses sufficient to produce emesis causing purgation, if sufficient of the active principle has been retained. Its emetic action is probably local.

As to the chemistry of the plant, Mr. Atkinson had, unfortunately, not sufficient material to make a satisfactory examination; but, so far as he went, he could find no trace of any alkaloid, the activity seeming to depend upon a bitter neutral principle, readily soluble in water, or in eighty per cent. alcohol.

ON CADAVERIC AND PHYSIOLOGICAL ALKALOIDS.

The assumption that Selmi was the first to prepare and investigate the cadaveric alkaloids or ptomaïne group appears to be erroneous; at least Armand Gautier, of Paris, claims this priority for himself in his recent exhaustive treatise of this subject published in the *Bull. de l'Acad. de Méd.*, 1886, vol. xv., Nos. 2, 3. Omitting the process of preparation of these ptomaïnes, or, as Gautier terms them, "bacteria alkaloids," we will briefly discuss their physiological and toxicological relations.

The ptomaïnes, as prepared by Gautier, belong chiefly to the pyridine and hydropyridine group, and represent oily, colorless fluids of a strongly alkaline reaction, which neutralize strong acids, and partially even abstract carbonic acid from the atmosphere. They also form crystallizable salts, are easily oxidized, and well capable to reduce metallic salts. Among these alkaloids parvolin, collidin, and hydrocollidin represent the principal products of bacterial decomposition.

As to the physiological effects of the ptomaïnes, Gautier quotes the conclusions arrived at by Gianetti and Corona, two Italian observers of note, as follows: "The cadaveric poisons are generally intensely poisonous, and cause in frogs dilatation of the pupils, followed by contraction, tetanic convulsions, with subsequent muscular relaxation, cardiac weakness, and total loss of the sensibility of the skin. Gautier himself instituted several experiments, with a certain base ($C_8H_{13}N$), which he had found to be identical with hydrocollidin. He found that in birds the alkaloid caused at first paralysis of the lower part of the spinal cord, the pupils, however, remaining normal. After death the heart was found to be filled with blood and in its diastolic phase.

Discussing the forensic aspects of the alkaloids, Gautier does not believe in the possibility of mistaking them for purposely-administered vegetable alkaloids.

Alongside of these cadaveric poisons there is another group of alkaloids that claims our attention, viz., that found normally in the economy, at least under certain conditions. These alkaloids are known under the name of leucomaïnes, and have been known ever since

Liebig, in 1849, discovered kreatinine, which is the best-known representative of this group. Next Liebreich found kreatine in the normal urine in 1869; then Pouchet allantoine and carnine, 1880, likewise in the urine. Gautier himself investigated the gland secretions of poisonous snakes, and ascertained the presence of alkaloidal substances without finding, however, the active principle of the saliva to be of an alkaloidal nature. Even from human saliva Gautier prepared an alkaloid, which, applied to birds, caused stupefaction.

In his conclusive remarks, Gautier dwells on the constant appearance of hydrocollidin among the cadaveric poisons, and regards this alkaloid, as it were, as the product of transformation of the most energetic species of bacteria. The leucomaïnes—*i.e.*, the alkaloids generated during life—are somewhat less toxic in their effects than the ptomaïnes, and partially act as narcotics upon the central nervous system, and partially upon the intestinal tract. Gautier regards the origin of leucomaïnes as a process of oxidation taking place in the animal tissues after the manner observed in anærobiotic bacteria. The accumulation of these products of tissue-change, due to their insufficient elimination through the skin, kidneys, and intestines, cause symptoms similar to those described above, which, in their entity, form an intoxication disease. The organism, on the other hand, resists this autoinfection by direct oxidation and elimination, and only if either of these physiological processes is interfered with the leucomaïnic intoxication sets in. Finally, Gautier remarks that he found—for example, in the snake-poison—alongside of these alkaloids other nitrogeneous but non-crystallizable substances, which are much more poisonous, and which will form the subject of future investigations of his.

CONTINUOUS RECTAL ALIMENTATION—AN ARTIFICIAL STOMACH.

Thanks to the labors of Sir William Roberts, of Manchester, and others in the field of artificial alimentation, the practice of sustaining life by rectal feeding is becoming more encouraging. The difficulty, however, in intermittent administration lies in the fact that the enemata, though small, are apt to cause a desire for defæcation. It occurred to Dr. Duncan J. McKenzie (*Brit. Med. Journ.*, June 19, 1886) that we might imitate the process of nature more closely by the gradual passage of a fluid from an artificial cavity in which its digestion takes place into the rectum for absorption. In this way the supply keeps pace with the absorption, and the belly is not loaded. The way in which he proceeds is as follows:

A piece of celluloid catheter (No. 5) is passed into the anus for about two inches; if passed too far, there is a risk of its being closed by the folds of gut. When once introduced, the sphincter closes upon it, and its presence is hardly felt by the patient; and the celluloid, rigid when introduced, becomes rather softer from the heat of the body. Previously to introduction, this piece of catheter is passed through a thick piece of india-rubber, perforated so as to grasp the catheter tightly. To the four corners of the india-rubber are attached tapes, which are tied, two in front and two behind, to a band round the loins. The india-rubber is passed close up to the anus, and the tapes are tied as tight as convenient. Over the outer end of the catheter is passed one end of a piece of fine india-rubber tubing, such as is used for babies' feeding-bottles. The piece of tubing should be about two yards long, and its other end slipped over a metal tube let in close to the bottom of a moderately tall narrow vessel, made of tin or other material, and capable of holding a pint of fluid. To increase steadiness, the bottom is leaded on the outside. The only other apparatus required are a milk-strainer to fit the mouth of the vessel, a table about the same height as the bed on which the patient lies, a few small boxes, or some suitable support by which the elevation can be varied, and an ordinary tea-cosy.

A pint of milk is warmed to a temperature suitable for pancreatic digestion; a little bicarbonate of sodium, and a proper quantity of some preparation of pancreas is added, and it is allowed to stand in a moderately-warm place for half an hour. It is then passed through the strainer into the vessel mentioned above. Dr. McKenzie finds that, after standing half an hour, the milk leaves little or no curd upon the strainer, and, when strained, readily passes through the tubes. If the curdling of the milk, by the pancreatic extract, give trouble, it may be prevented by previously adding one-fourth of its bulk of water to the milk (Roberts).

The milk, having been put into the vessel, which acts as the artificial stomach, it is raised from two to two and one-half feet above the level of the patient's bed, the height being altered according to the rapidity with which the milk runs through the tube. The vessel is then covered with the cosy to

keep it warm, and, if necessary, a heated plate may be put under it at intervals. The pint of milk should run into the rectum in about three hours, which time fairly corresponds to the average digestion-period of pancreatized milk. If a desire for defæcation be felt, the flow should be made slower, or the apparatus entirely removed for a time.

When the milk has all run out, the apparatus is removed, some clean water passed through the tubes, and the patient allowed to rest for a time before reintroduction.

In this way, a patient of Dr. McKenzie's, suffering from cancer of the stomach, in whom the colon was obstructed at the junction of the transverse with the descending portions, received an average of three pints of milk per day for a month, with an average daily evacuation of about a pint, consisting chiefly of curd; his nutrition was fairly kept up until vomiting of blood, mucus, and fæcal matter became excessive; and, after death, the whole descending colon was found well nourished and containing condensed milk. His evacuations generally took place from two to eight or nine hours after milk had been administered, care being taken not to give any when the rectum felt irritable.

FILEHNE'S LATEST OBSERVATIONS ON CAFFEINE AND ALLIED SUBSTANCES.

Prof. W. Filehne, of Erlangen, has instituted another series of experiments with the caffeine group, and communicated his valuable results to the *Archiv für Anatomie und Physiologie* (*Physiol. Abtheil.*), 1886, Nos. 1, 2, from which we have prepared the following condensation:

I. CAFFEINE.

Caffeine produces, according to the majority of authors, when given to frogs in a sufficiently large dose, muscular rigidity and even tetanus. Schmiedeberg, however, claims that these effects can only be obtained in the rana temporaria, and that in the rana esculenta the convulsive phenomena originating from the central nervous system predominate. On the second or third day of the experiment these differences equalize each other, the former species of frogs showing a heightened reflex irritability, and the latter a certain muscular rigidity.

In no other animal besides the frog does caffeine produce such prompt and complete rigidity, though Johannsen and Binz speak of muscular stiffness caused by the drug in cats and dogs. Filehne has, by his carefully-conducted experiments, disproven the claims of Schmiedeberg, as stated above. 7 mgrms. of caffeine injected under the skin of an esculenta weighing about 20 grms., sufficed to generate a reflex hyperirritability with irradiation of reflexes; 12 mgrms. caused very soon a lasting tetanus. 0.05 to 0.15 grm. of caffeine introduced into the stomach produced a muscular rigidity, appearing very promptly and rapidly reaching a maximum. This shows that, provided larger doses are used in experimenting, there is but a difference of degree and not of principle in the behavior of the two species of frogs under the influence of caffeine.

II. THEOBROMINE.

The observations made heretofore on theobromine are very scanty. According to Mitscherlich (*Der Cacao und die Chocolade*, Berlin, 1859, p. 88) the drug has qualitatively an action similar to that of caffeine; 0.06 grm. of it suffice to kill a frog. Filehne experimenting with theobromine obtained by the hypodermic injection of 7 mgrms. in frogs no other effects besides a reduction of the motor power. Using after four hours 5 more mgrms., he noted the gradual decrease of voluntary motions and reflex action until death set in through central paralysis after eighteen hours. Quite different effects, however, were obtained by the employment of large doses (15–30–50 mgrms.) from the beginning. Fifteen minutes after administration of the drug the entire muscular apparatus of the animal assumed a rapidly-deepening rigidity, from which the cardiac muscle alone is exempted. This rigidity takes place just the same in muscles, the nerve of which has been cut, and also in curarized animals, but not in parts in which the artery has been tied. Shortly before appearance of the rigidity reflex sensibility is distinctly lowered.

III. XANTINE.

The spinal paralysis and muscular rigidity, as produced by both caffeine and theobromine, can likewise and to a still greater extent be provoked by xantine. If the iliac artery is tied, we obtain a gradual decrease of the voluntary and reflex motions of the corresponding extremity without any preceding increase of reflex sensibility. It is noteworthy that while even after larger doses of caffeine and theobromine the heart-muscle remains intact, this organ under the influence

of xantine presents early signs of rigidity, though it continues to beat.

DERIVATIVES OF CAFFEINE.

(*a*) *Hydroxy-Caffeine.*—This substance injected into the lymph-spaces causes, even in a quantity of 100 mgrms., no obvious effects. Filehne attributes this to the fact of the drug being readily decomposed in the organism; doses of 0.2 grm., however, produced caffeine-like symptoms.

(*b*) *Diethoxy-hydroxy-Caffeine.*—This derivate showed itself also to be inert in the frog, and very probably for the reason given above.

(*c*) *Ethoxy-Caffeine.*—The addition of the ethyl group lends to this chemical a peculiar narcotic influence upon the brain and spinal cord. It causes stupefaction and paralysis without affecting the circulation or (to any great extent) the motor apparatus. In rabbits the drug causes sopor and actual sleep if injected into the stomach in a dose of 0.5 grm. In man the drug causes no effects in a dose of 0.2 grm.; after gifts of 0.3 to 0.5 grm. the arterial tension is raised (the pulse increasing two to six beats per minute), the face reddens, sweating and a soporous state sets in. Doses of 0.5 to 0.75 grm. produce severe headache and coma. Gifts of 0.1 to 0.5 grm. cause a somewhat sounder sleep than normally present; still larger doses, however, disturb the sleep. Filehne advocates the trial of this drug in cases of megrim.

PRODUCTS OF DECOMPOSITION OF CAFFEINE.

(*a*) Caffeidine shows in doses of 100 mgrms. a slight caffeine-like action. (Stricker.)

(*b*) Caffuric acid causes in the same dose a temporary increase of the reflex excitability and a certain muscular relaxation.

(*c*) Hypo-caffeine is totally inert in doses of 50 mgrms.; in larger doses a slight hyperæsthesia results.

(*d*) Caffoline is totally inert.

SUBSTANCES ALLIED TO THE XANTINE-CAFFEINE GROUP.

(*a*) Guanineis in doses of 100 mgrms. and more is inert in frogs.

(*b*) Uric acid (an oxy-xantine) is likewise inert.

SARKINE.

Though, according to Fischer and Kossel (*Zeitschrift für physiologische Chemie*, vol. vi. p. 428), the chemical relationship of sarkine to the xantine group is of a doubtful nature, Filehne examined its physiological action, nevertheless, in connection with the above researches. Doses of 15 to 100 mgrms. cause an increased reflex sensibility and reflex irradiation, with spontaneous paroxysmal cramps becoming ultimately tetanic in nature. Death finally ensued under symptoms of extreme muscular rigidity.

CARBOLIC ACID IN THE TREATMENT OF WHOOPING-COUGH.

Dr. C. W. Suckling writes to the *British Med. Journal*, July 24, 1886, that he has used the glycerin of carbolic acid with great success among his out-patients at the Children's Hospital in the treatment of whooping-cough. He had previously used almost every other drug in different cases, but never with any very satisfactory results. He states that he has notes of twenty-three cases treated with glycerin of carbolic acid.

Half a minim in peppermint-water is sufficient for a child a year old, the dose increasing with the age. In twenty cases, relief was quickly given; the general condition of the patients was at once improved, and the number and severity of the paroxysms of coughing diminished. None of these cases attended more than a fortnight, while the usual length of attendance is certainly twice as long. In three cases, the carbolic acid failed to give relief. There was no doubt as to the nature of the illness in these cases, for in all the characteristic cough was heard, or ulceration of the frænum present.

Dr. Suckling has observed ulceration of the frænum to be present in fifty per cent. of cases of whooping-cough, and he believes that its presence is pathognomic of the disease. He also believes carbolic acid almost deserves to be called a specific for pertussis.

THE PHYSIOLOGICAL AND THERAPEUTIC PROPERTIES OF ETHOXY-CAFFEINE AND OTHER DERIVATIVES OF CAFFEINE.

Dujardin-Beaumetz, convincing himself of the correctness of Filehne's observations on the derivatives of caffeine, tried ethoxy-caffeine in a number of affections marked by cephalalgia (*vide Bull. de Thérap.*, vol. cx., March 30, 1886). In order to render this drug soluble in water, and at the same time to obviate the dyspeptic symptoms easily caused by it, Dujardin-Beaumetz recommends the following mixture:

℞ Ethoxy-caffeine,
Sodii salicyl., aā gr. iii;
Cocain. mur., gr. iss;
Aquæ tiliæ, f℥ii;
Syr. simpl., f℥i. M.
S.—Take at once.

The results obtained with this drug in megrim were highly satisfactory. In one case the drug was given in a dose of about 1 grain at the height of a paroxysmal pain in the head. with the effect of wholly removing the pain in two hours. In four other cases the pain was abated in less than one hour. Dujardin-Beaumetz advises to give no larger doses than 3 grains, since 7 grains can produce gastric cramps, nausea, and even cerebral disturbances. In cases of prosopalgia the drug proved likewise to bring relief and cause sleep.

These and similar observations have led Dujardin-Beaumetz to assume that ethoxy-caffeine prevents the therapeutic and physiological effects of caffeine in a modified manner, and that it owns a pronounced sedative or narcotic action, allowing of its advantageous substitution for caffeine in cases of megrim.

THE INFLUENCE OF PURE TEREBENE ON FERMENTATION.

In a lecture recently delivered at the Westminster Hospital, Dr. Murrell referred to the power exerted by pure terebene in arresting fermentation, and gave the details of some experiments which he had made. He took two beakers of the same size and shape, and, in each of them, placed two hundred and sixty-five cubic centimetres of water and a little hay. To one of them he added half a cubic centimetre of pure terebene. Both beakers were covered with glass plates, and placed in a warm chamber, at 36° C. (96.8° Fahr.). Two days later the test-beaker was examined, and the fluid was found to be swarming with moving particles, so minute that they could with difficulty be seen with a Zeiss D. The other beaker smelt strongly of the pure terebene, but nothing moving could be detected when examined with the same lens. On the ninth day from the commencement of the observation the hay-infusion was turbid; a film had formed on the surface, and the fluid was distinctly offensive. Under the Zeiss D numerous monads were seen, with large numbers of moving organisms. The other beaker was clear; there was no film on the surface; the slight sweet smell of pure terebene was still perceptible, and moving organisms and monads were absent. On the eleventh day the temperature of the warm chamber was somewhat higher, having risen to 40° C. (104° Fahr.). The specimens being again examined under the Zeiss and a Ross's one-eighth power, the field of number 1 was found to be covered with moving organisms, but in number 2 nothing was to be seen on most careful examination. The test was a rough one, but it is clear that a two per cent. solution of pure terebene will arrest fermentation in a hay-infusion. On a subsequent occasion the experiment was repeated with 1 part in 1000 of pure terebene, the infusion being kept this time at a temperature of 20° C. (68° Fahr.). In fifty-one hours the test-solution, examined with a one-twelfth Ross's objective, was found to contain hay-bacilli in large quantities in motion, also numerous paramœcia. The solution containing terebene (number 2) was not absolutely free from moving organisms, but they were fewer and less developed, and no paramœcia were found. At the expiration of seventy-five hours number 1 was seen to be swarming with paramœcia and hay-bacilli breaking up into spores; number 2 contained only a few moving organisms, and no paramœcia. Two days later number 2 was swarming with paramœcia, whilst they had all disappeared from number 1. The influence of pure terebene on paramœcia was demonstrated in another way. A specimen of hay-infusion swarming with paramœcia was put under the microscope and examined with Ross's one-twelfth inch. Several large specimens being under observation, a drop of pure terebene was placed at the edge of the cover-glass, and drawn through with blotting-paper. The paramœcia were at first but little affected, but after a time their movements almost ceased, although their cilia could still be seen languidly beating. A drop of water was then drawn through, and almost immediately the paramœcia became as active in their movements as ever.

Pure terebene was found to have the power of arresting or preventing the fermentation of yeast. Two small bottles, of identical size and shape, were filled with a mixture of saccharine urine and yeast. To one bottle was added pure terebene, in the proportion of 1 in 450. The bottles were inverted in the ordinary way, in a flat vessel containing water, and were placed in the warm chamber. In forty-eight hours fermentation had taken place in one bottle, and all the fluid had been driven out, while the bottle to which terebene had been added remained full. On the third day

a few small bubbles of gas appeared in it, and on the seventeenth day it contained only about one-fourth of gas. The effect of pure terebene in this experiment was very marked. On another occasion two bottles were taken, each holding six and a half ounces. In each was placed half an ounce of cane-sugar syrup mixed with a little yeast. One was filled with water; the other with water containing 1 in 1000 of pure terebene; and both were inverted in shallow dishes containing water, and placed in a warm chamber. The bottles were observed day by day for six days, and the carbonic acid gas was found to accumulate twice as quickly in the former as in the latter. On another occasion two specimens were treated in a similar manner, and at the expiration of fifty-one hours both were examined microscopically. There was not much difference in the character of the torulæ, but those in the bottle containing terebene were less developed.

Pure terebene undoubtedly exerts an influence on lactic acid fermentation. Two beakers were taken, each containing two hundred and fifty cubic centimetres of fresh milk. To one of them was added five cubic centimetres of pure terebene, and both were placed in the warm chamber, at a temperature of 42° C. (107.6° Fahr.). At the expiration of twenty hours they were examined. The milk in one was found to be curdled, and strongly acid. That in the beaker containing terebene had a slight film on the surface, but was quite fresh, and was neutral in reaction. It was sweet and pleasant to the taste, except for the smell of pure terebene. The greater part of the pure terebene was found floating at the top. Twenty-three hours later this milk was curdled, and had a strong acid reaction.

Dr. Murrell stated that these observations were made in the Physiological Laboratory of the Westminster Hospital, in December, 1880, and led to a trial of the drug in cases of irregular fermentation in the stomach,—acidity, flatulence, etc.; and its subsequent introduction as a remedy for winter-cough.—*Brit. Med. Journ.*, July 24, 1886.

THE ALKALOIDS OF JABORANDI-LEAVES.

Prof. Harnack, of Halle, and H. Meyer, in some previous publication (*Annalen der Chemie*, vol. cciv., p. 67), pointed out that pilocarpine could easily be changed into jaborine, a substance acting like atropine, and Merck even claimed that jaborine was always present in minute quantities in the commercial pilocarpine. And still another alkaloid besides pilocarpine and jaborine has recently been obtained by Meyer, which he termed pilocarpidine, and described in the *Archiv für experimentelle Pathologie*, 1886, vol. xx., Nos. 5, 6. Omitting the chemical properties of the new alkaloid, which approximate those of pilocarpine closely, we beg to briefly review its principal physiological features.

The action of pilocarpidine is essentially identical with that of pilocarpine, only less pronounced. In a cat 7 weeks old which received 0.01 grm. of pilocarpidine hypodermically the drug induced a state of intoxication, which would have been fatal unless speedily counteracted by atropine. Among the more prominent symptoms of the poisoning by pilocarpidine Meyer mentions increased perspiration and lachrymation, besides diarrhœa, vomiting, and dyspnœa. In rabbits pilocarpidine causes likewise salivation and diarrhœa, but does not, even in doses of 0.2 grm. (3 grains), susceptibly influence the respiratory and cardiac functions. While 0.1 grm. of pilocarpine (1½ grains) produces in a rabbit a profound intoxication and death, Meyer observed, after the subcutaneous employment of 0.5 grm. (7 grains) of pilocarpidine, no materially morbid symptoms; even 0.3 grm. (4½ grains) introduced directly into the circulation caused no intoxication. It is probable that the innocuousness of the drug results from its rapid decomposition in the animal organism. In frogs pilocarpidine showed likewise a much weaker action than pilocarpine. Jaboridine (an alkaloid into which pilocarpidine is easily changed) has hitherto, by Meyer, been tested exclusively on the frog's heart, and was found to closely resemble in its physiological properties those of jaborine and atropine, as intimated above.

THE ALTERNATIVES OF CRANIOTOMY.

At the meeting of the British Medical Association, recently held at Brighton, England, Dr. Barnes read a paper with the above title before the Obstetrical Section, of which the following is a summary (*Lancet*, August 14, 1886):

1. The legitimate aspiration and the tendency of science is to eliminate craniotomy on the living and viable child from obstetric

practice. 2. The advance of hygienic rule, the improvements, the forceps, in turning, in the induction of labor, and in obstetrics generally, have materially curtailed the field within which craniotomy can be justifiably applied. The extension of the axis-traction curve to the forceps will, he believes, still further curtail the resort to craniotomy. 3. In the most extreme degrees of pelvic distortion, where delivery *per vias naturales* can only be effected by the best appliances and the highest skill, and with appreciable risk to the mother, Porro's operation is the legitimate alternative for craniotomy, if the opportunity of inducing abortion be gone by. 4. In less advanced degrees of pelvic contraction, but still incompatible with the delivery of a living child *per vias naturales*, the opportunity of inducing abortion having gone by, the Cæsarean section may be a legitimate alternative of craniotomy. This is the most debatable point. 5. In the minor degrees of contraction, say from three inches to three and a half inches, the opportunity for inducing premature labor having gone by, the far greater safety to the mother obtained by craniotomy makes this the proper course to adopt; at least, until it can be shown that the Cæsarean section is so improved as to be equally safe to the mother. The mother's right to be rescued stands before that of the child. 6. In other emergencies than deformity, as in obstructed labor from ovarian tumors, the alternative to craniotomy, if possible, is to remove the tumor. 7. In cases of immovable tumors, Porro's operation is the proper alternative. 8. In ruptures of the uterus, the child being delivered or not, Porro's operation is the proper alternative. The interests of mother and child coincide. 9. In cases of disease or tumors of the uterus, Porro's operation will generally be the proper alternative. 10. In atresia of the cervix or vagina, craniotomy or Cæsarean section may be necessary, but incisions and dilatation may more frequently be the proper alternative. 11. When obstruction is due to hydrocephalus, or dropsy in the child, embryotomy or tapping is indicated. 12. When the child is dead, embryotomy is indicated, and decollation when turning is hazardous from impactions of the child. 13. In convulsions and hemorrhages, the proper alternatives for craniotomy are found in the more scientific methods of concluding labors under these complications. Lastly. But the dream of Tyler Smith, the abolition of craniotomy, will be fully realized only when hygiene shall have triumphed over disease and deformity.

NEW FACTS ABOUT COCAINE.

DUJARDIN-BEAUMETZ communicates to the *Bull. de Thérap.*, vol. cix., No. 12, p. 529, a number of interesting data concerning cocaine, partly of an historical and partly of a therapeutic character, which we will present to our readers *en résumé*.

According to our author the anæsthetic action of cocaine has been called attention to as early as 1868 by Moreno y Meris (*Sur la Cocaine, Thèse de Paris*, 1868), and its analgesic virtues have been utilized in affections of the pharynx and larynx as early as 1877 by Saglia, Cazal, and Gougenheim, as can be seen from the *Bulletin de Thérapeutique*, 1882, p. 53. It is probable, however, that not the alkaloid cocaine, but the coca-leaves, or an extract prepared from them, was used by these physicians.

Cocaine appears to have an action just opposite to that of curare, and applied locally anæsthetizes not only mucous membranes, but also the skin. If 0.02 grm. (⅓ grain) of a two per cent. solution of cocaine is injected into the forearm, the skin loses its susceptibility over the point of injection and neighboring area for at least twenty to thirty minutes. Still, such injections are mostly attended by constitutional disturbances of no light nature. Drs. Bardet and Meyer, assistants of Dujardin-Beaumetz, anæsthetizing for the sake of an experiment their own skin, observed on themselves half an hour after the injection a considerable dilatation of the pupils and comatose symptoms. One of them fell in a state of vertigo, marked by pallor of the face and extreme weakness of cardiac action. These symptoms, moreover, recurred at every attempt to leave the horizontal position. In patients, Dujardin-Beaumetz observed analogous phenomena. A woman who, for the purpose of a painless dilatation of the anus, had received a hypodermic injection of cocaine into the perineum, was seized by vertigo, nausea, and a cramp-like working of the nostrils. Another patient experienced similar sensations, and in addition to them a feeling of growing lighter and flying away. All these evidences of intoxication had resulted after hypodermic doses of 0.01 to 0.02 grm. (⅙ to ⅓ grain), doses which had been never exceeded. The fact that the stated symptoms occurred only in the erect position seems to suggest their relation to a state of cerebral anæmia caused by cocaine, an assumption which is strengthened by the observation that the mentioned phenomena did not occur in robust persons, and

were singularly pronounced in anæmic individuals.

According to the testimony of Grasset and Nègre, cocaine causes in animals cramps of a clonic nature. In monkeys 0.06 grm. (1 grain) were required to obtain this effect. The influence of the drug upon the animal temperature is manifest, though different according to the species of animals experimented upon. In a dog the temperature is raised, in the monkey lowered. Applied to the exposed blood-vessels of a frog, cocaine produces at first a distinct dilatation, and later a strong contraction, as observed by Rigolet, with a one per cent. solution. To obtain direct evidences of poisoning somewhat larger doses are required. Rigolet gave to a dog weighing eighteen kilogrammes 0.43 grms. (6 grains) of hydrochlorate of cocaine by intravenous injection without any detriment, and Bignon (of Lima) has figured out that the Indians take with impunity as much as 0.4 grm. (6 grains) of cocaine by the chewing of coca-leaves.

According to this observer cocaine is also soluble in vaseline, though he never saw any anæsthetic effects resulting from the rubbing in of this vaseline or of other solutions of cocaine into the skin, provided the epidermis was intact. To obtain anæsthesia cocaine is to be applied upon the denuded cutis or subcutaneously. In the former application the action of cocaine is very prompt, and can be advantageously employed to obviate the intense pains following upon severe burns and other accidents. Dujardin-Beaumetz recommends the exhibition of cocaine subcutaneously in all those cases in which a painful operative section of the cutis is necessitated. He has successfully resorted to the cocaine injection in cases of pleurotomy, in the opening of abscesses, tracheotomy, and the extirpation of a lupous neoplasm. It is best to inject about ten minutes previous to the operation, the patient being in a horizontal position. In operations for phimosis the cocaine injections are contraindicated on account of the resulting œdema.

Locally, solutions of cocaine are to be warmly recommended in almost all painful affections of the layrnx and pharynx, in tubercular subjects a few minutes before meals to facilitate the often painful swallowing, before introduction of the œsophageal bougie to check the attempts at vomiting, and finally interstitial injections in the anal region for a painless dilatation of the sphincter. Likewise are the suppositories of cocaine indicated in painful hemorrhoids and in vaginismus. Dujardin-Beaumetz has also employed cocaine internally, and pronounces its analgesic virtues in all painful and cramp-like conditions of the stomach truly marvellous, far surpassing the services rendered by opium.

In this connection our readers will recall that cocaine has also been recommended in singultus (by Compardon) and in whooping-cough (by Prior), but that Henoch never saw any beneficial results of its application in the latter affection.

THE TREATMENT OF NEPHRITIS.

According to the Paris correspondent of the *Lancet* (July 24, 1886), it is admitted in practice that nephritis in patients suffering from scarlet fever is not always in relation to the gravity of the eruptive disease. Prof. Jaccoud, following the example of Dr. Musatti, who established the fact that milk diet, instituted at the commencement of the malady, is the best remedy to prevent renal complications, employed the same treatment with great success. According to certain authors, renal albuminuria resulting from scarlet fever is very prevalent in some epidemics, and the number of cases so affected has been known to mount up to fifty per cent.,—that is, including both slight and grave cases; but Prof. Jaccoud, since adopting this method, has never had a single case of renal albuminuria. According to him, the real prophylactic treatment of this complication consists in the administration of milk from the first day of the malady, without waiting for the appearance of albumen in the urine. Milk alone should be given, both as food and medicine,—three litres per day if possible. Dr. Musatti condemns the use of the cold bath in scarlet fever, not only on account of the difficulties attending this mode of treatment, but also from the collapse and other complications that may be produced.

ANÆSTHESIA IN CONFINEMENT.

The questions whether or not anæsthesia is a desirable adjuvant of parturition, and what anæsthetics can claim the preference, will apparently never disappear from the store of professional discussions. Seemingly answered, settled and done away with, the subject is certain to loom up again after definite intervals.

In the Berlin gynæcological clinics (under

the superintendence of Schröder), Dr. E. Cohn instituted recently comparative trials with various anæsthetic agents, the result of which we find represented in *Schmidt's Jahrbücher* of June 1, 1886, p. 48. In Berlin the chloroform narcosis is the usual one, hence it was deemed only requisite to try monoxide of nitrogen and bromide of ethyl. We condense here the main conclusions arrived at by the experimenter.

The monoxide of nitrogen was mixed with oxygen in a proportion of two hundred volumes of the former to fifty volumes of the latter, and was administered from a gasometer through a mouth-piece covering the mouth and nose closely. Cohn could verify in general Döderlein's observations made with this gaseous mixture in labor, as set forth in the *Archiv für Gynæcology*, vol. xvii., No. 1. The heart was not influenced in any way by this gas, while the frequency of the respiratory act was distinctly raised by it, an observation directly opposed to that of Döderlein. A state of actual excitation was observed only in three cases out of twenty. Usually the confined women grew quiet after a few inhalations of the gas, answered correctly to all questions, and were well able to strain without having the consciousness of pain. On awaking after removal of the mask, the women never knew what had happened to them. In spite of the on the whole favorable results obtained with this anæsthetic, Cohn hesitates to recommend it for gynæcological practice on account of its being too unhandy to use, and besides of being too expensive, a single narcosis costing ten to twelve marks (two and a half to three dollars).

Cohn also took pains to ascertain the merits of bromide of ethyl, recommended three years ago for gynæcological purposes by Häckermann. According to Cohn's testimony, this anæsthetic does not unfavorably influence the straining process, removes pain, and leaves circulation and respiration wholly intact. There is one inconvenience, however, connected with this gas, viz., its garlic odor, which, after the elimination of the gas from the lungs of the woman, grows a source of discomfort to herself, her attendants, and possibly also to the child.

As to chloroform, it is well known that this gas exerts also a decidedly favorable impress upon parturition, removing the sensation of pain without lessening the straining power of the woman, provided no complete anæsthesia is induced. Chloroform has besides never been known to have produced any detrimental after-effects to the confined woman. Asphyctic conditions are exceedingly rare, provided the drug used be pure and no cardiac or pneumonic trouble present in the woman. The only objectionable feature in chloroform is that its action, especially in a prolonged narcosis, also affects the child. But as a prolonged narcosis is rather an exceptional requisite in confinement, the intimated objection of this anæsthetic is of little consideration. The general conclusion arrived at by Cohn from his comparative trials with various anæsthetic agents in confinement is that chloroform is the most eligible drug, and bromide of ethyl a valuable substitute for it.

EARLY OPERATIVE TREATMENT OF MORBUS COXÆ.

The April Bulletin of the Royal Academy of Medicine of Rome reports the presentation, by Dr. P. Postemski, of three boys with hip-disease. Two cases had been treated by the expectant method,—counter-irritation and extension, douching and immobility. Abscesses and sinuses formed, and recovery, with considerable deformity, only occurred after the treatment had been persisted in,—in one case for two, in the other for four years. In the third case early excision of the head of the femur was followed by rapid recovery. The operation was performed through a semilunar incision behind the great trochanter. The joint contained purulent serum, and was the seat of fungus synovitis. Only a few erosions were visible on the head of the bone. After removing it, the neck of the femur was rounded and refitted into the acetabulum, previously cleaned out by scraping. Drainage, union by interrupted suture, extension, and sublimate dressings were not disturbed for twenty-nine days, when union by first intention was ascertained. All the dressings were removed on the thirty-fifth day. At the end of eight weeks the patient was able to walk on crutches, and he could dispense with them when presented to the Academy. The case is unquestionably one of deep interest, but its progress at a later stage must be noted before a correct judgment can be formed. Assuming the issue to be entirely favorable, the advice to excise the head of the bone in the early stage of hip-disease raises grave questions. Granted that the danger of the operation is much less in children than in adults, and that the proportion of recoveries is largest when excision is practised before the joint is completely disorganized, two

results of experience are specially noteworthy. A large proportion of hip-joint patients do well under appropriate constitutional and local treatment; and excision of the hip is an operation involving risk to life, without the certainty of a strong and useful limb.—*Lancet*, July 24, 1886.

NEURALGIA OF THE PUDIC NERVE.

PROFESSOR ADAMKIEWICZ mentions in the Polish journal ***Medycyna*** a somewhat rare case of neuralgia affecting the pudic nerve. The neuralgias of the ovary and uterus in women and of the seminal ducts in men are, he says, usually described as neuralgiæ pudendo-hæmorrhoidales, but they have not been well worked out. The present case is interesting because the nerve affected arises from the pelvic plexus. Three years ago the patient began to suffer two months after her second confinement with painful spasm of the urethra whenever she attempted to micturate; sometimes, indeed, this spasm prevented her from voiding her urine. Afterwards the pain spread to the vesical region and became more and more frequent, so that at last the woman was scarcely ever free from it. Every movement of the body and any irritation or excitement increased it, and induced a desire to micturate. Morphine and absolute rest in bed produced some alleviation only. A painful spot was found where the gluteus maximus crosses the tuberosity of the ischium, and another on the inner surface of the ascending ramus of the ischium. The treatment adopted was electrical, the anode of a constant current battery being placed between the tuberosity and the spine of the ischium, and the cathode on the sacrum. After daily applications of a few minutes' duration for three months the patient was completely cured.—*Lancet*, July 24, 1886.

Correspondence.

PROPRIETARY MEDICINES.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I have a few words to say about proprietary medicines, a question of vital importance to every physician,—a question which has already been discussed in the GAZETTE from the ethical and legal point of view, but whose business relation with physicians, the question of dollars and cents, does not seem to have been appreciated. For the last ten to twenty years the whole horde of so-called manufacturing chemists and pharmacists have been putting upon the markets various sorts of proprietary nostrums. At first there were many of us that looked upon it as a commendable business, but now there are many of us who can plainly see that, from a business point of view, it is the worst enemy that the profession has to contend with. When these remedies were first originated the owners or proprietors depended upon the profession to introduce them, or at least they pretended so to do. But they were not satisfied with the legitimate demand that was thus produced, but then commenced advertising in the daily and weekly press, and thus brought themselves down to the position occupied by such men as vendors of "cure-alls." You can scarcely pick up a paper to-day without the first thing you see is *Tongaline*, or some other similar substance, in blazing type, lauded to the skies as a positive cure of about all the diseases known of nervous origin. You see attached the testimonials of popes, clergymen, and bishops, and you usually find the regulation lie attached,—*i.e.*, that the poor unfortunate had been the rounds of all the doctors, and had no benefit until he got *Tongaline*, etc. Now I don't hesitate to say that the companies that manufacture and advertise such trash are working against the physician direct, and also that they are not honest, and their remedies should be boycotted by the profession. The remedy mentioned is illustrative of a great many others on the market equally objectionable.

I think it is time that the profession was roused upon this question. We must protect ourselves, or sooner or later the load will be too heavy for us to stand up under. There is no doubt in the world but what the science of medicine is making gigantic strides, as far as the acquisition of knowledge is concerned; but, on the other hand, contrary to justice and right, our worth and benefit to society is not acknowledged by the masses as it should be, and I lay the blame at the door of these quack nostrums, whose advertisements are to be seen in almost every paper. Coming out in plain words, and giving the therapy of their remedies, telling the names of the diseases for which they are to be used, thus placing the remedies directly in the hands of the laity.

It is a fact that the larger per cent. of the cases we are called to see nowadays here in this country are critical cases, made so by the patient depending on these proprietary reme-

dies and simply sending for the doctor as a last resort. You take the ordinary physician, and the practice that he desires most is just the kind that is taken away from him by these quack nostrums. For my part I am getting tired of it, and I want the agitation of this question to commence and be kept up until something is accomplished.

I have nothing to say against a remedy whose correct formula is on each bottle; this plan will insure a pure and cheap article, since with the removal of secrecy the incentive to fraud is removed. We have to go to work and sustain ourselves. We have the intelligence, the influence, and the right on our side, and we cannot afford to ignore this question. If we do not defend ourselves the proprietary medicine-man and druggist will completely do away with our business. Why here last year I told a druggist to get some bromo-caffeine, which I prescribed for a lady's headache; it cured her and I got fifty cents for the prescription. Since that time the remedy has been sold indiscriminately by the druggist. He has even sold it in the original package without destroying the label, and it is nothing for the people to go to the druggist first when they want medicine. Bromo-caffeine is all right, but it was a decidedly losing investment for me when I ordered it. Now let all physicians who have their best interests at heart join in and use their influence against any manufacturer who stoops to quackery and charlatanism by advertising his or their remedies outside of proper channels, or who keeps secret the formula. Never prescribe any nostrum whose label does not contain the correct working formula. We can influence legislation, we can work among our patrons, and in our daily intercourse with men we can start the ball rolling; in fact, we can in the next ten years make ourselves heard and felt all over the land.

Yours respectfully,

J. Z. SCOTT, M.D.

SCANDIA, KANSAS, July 16, 1886.

TREATMENT OF IVY-POISONING.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I have read with more than ordinary interest the reports from different sources on ivy-poisoning. Not only for information gained, but from the fact that I have had my share in the experimental treatment of the trouble.

As has been stated, cases would present themselves so badly poisoned as to make the features entirely beyond recognition, and often the whole body the same way, with all the accompanying discomforts. I tried the whole list of prescribed remedies with but partial or no relief.

One day a patient came in suffering terribly on whom I had been experimenting, saying I must certainly do something for his relief, as he could stand it no longer. There was a bottle of bromine on my table that I had been using as caustic. I determined to try a mild preparation of it in this case, as it might by its caustic action neutralize the poison. So I fixed up the following, with the result that in two days he was perfectly comfortable:

℞ Bromine, gtt. xxx;
Vaseline, ℥iii;
Glycerin, ℥ii;
Cologne, q.s. to scent. M.

S.—Apply morning, noon, and night, first washing the poisoned part with salt water. Let the ointment remain one-half to one hour, then wash off with any fine soap.

I have used this time and again since, and no difference how bad the poison, always with the same result. It always stopped the trouble in two to four days.

J. W. LILLY, M.D.

TOLEDO, OHIO, August 21, 1886.

TREATMENT OF IVY-POISONING.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the July number of the GAZETTE I note the inquiry of L. B. Parsell, M.D., of Closter, N. Y., relative to the treatment of ivy-poisoning. Having had a number of cases this present year, I found in seventeen cases that the following prescription acted almost as a specific, cutting short the spread of the poison and allaying the intense itching:

℞ Plumbi acetat., ℥ii;
Bromo-chloral, ℥i;
Aqua pura, q.s. ℥iv. M.

S.—Shake well, and apply three or four times a day, first washing parts well with warm water and Castile soap. The strength can be varied according to age of person and severity of poison.

Would be glad to hear through medium of GAZETTE the results of the same.

Respectfully,

M. A. HOOVER, M.D.

KEARNEY, NEB., August 19, 1886.

COCAINE IN DYSENTERY.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the GAZETTE of July 15, Dr. R. L. Hinton gives his experience in the

use of cocaine, and calls the attention of the profession to its value in dysentery.

The *New York Medical Journal*, of April 24, 1886, contains the proceedings of the Clinical Society, of January 22, 1886, at which meeting I reported the good results I had had in dysentery treated by cocaine.

The *New York Medical Record*, of December 5, 1885, and February 20, 1886, gives short notices on the same subject.

In my lectures to the students of the Medical Department of the New York University, at the opening of the session of '85–'86, I taught the application of this new and important therapeutic agent in dysentery.

Yours respectfully,

JOSEPH E. WINTERS.

36 W. 32D ST., NEW YORK, August 3, 1886.

TREATMENT OF IVY-POISONING.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—On page 491 of the July number of THERAPEUTIC GAZETTE, Dr. L. B. Parsell, of Closter, N. Y., asks for a remedy that will cure the poison of rhus toxicodendron, to which I would like to reply through the columns of your valuable journal, not only for his benefit but for that of all others, by referring him to page 286, August number of THERAPEUTIC GAZETTE, 1882, where I have already answered this question. I have never, for about twenty-five years, prescribed anything for this rash except the cold infusion of red sassafras-root applied by wet cloths and the drinking three times a day, or *ad libitum*, the warm tea of the same. Never failed to cure the most aggravated cases in one to three days, without a single exception, and I have had cases come to me that had baffled other physicians. This is a simple remedy, cheap, and pleasant to the patient, and I wish every physician who has a case of this rash, and can procure the fresh root, would give it a trial.

R. L. HINTON, M.D.

PRESCOTT, ARK., NEVADA CO., August 4, 1886.

TREATMENT OF IVY-POISONING.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In your July number, Dr. Parsell asks for a remedy for the poison of ivy. In addition to the prescriptions from the *Journal of Cutaneous and Venereal Diseases*, which you quote, I would suggest a trial of *menthol*, a solution in ether or alcohol of one drachm to the ounce. Although I have not used this drug in this particular affection, my experience with it in erythemas due to other causes has been so favorable that it would seem to merit trial in this (see page 51 of the current volume of the GAZETTE). And if Dr. Parsell would be kind enough, I would be glad to see his report in some future number of your journal.

Very truly yours,

SELWYN A. RUSSELL, M.D.

135 N. PEARL ST., ALBANY, N. Y.

THE TREATMENT OF IVY-POISONING.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I see in the July number of the GAZETTE an inquiry made by L. B. Parsell, M.D., of Closter, N. Y., asking for "a remedy for the poison of wild ivy."

I have been engaged in the practice of medicine in the West since 1852, and have treated a large number of cases of ivy-poisoning with satisfactory results, and I think the following formula will prove very nearly a "specific":

℞ Solanum dulc. (bittersweet), bark of root, ℥i;
Sambucus (elder), inner bark,
Lobelia inf. (herb), āā ℥i;
Lard (or vaseline), ℥iv. M.

Simmer over a slow fire for four hours. Strain, and apply freely to the parts affected.

If the case is a bad one, saturate a thin cloth with the salve, and keep the affected parts wholly covered with the cloth.

Yours,

B. C. PARKER, M.D.

WILBER, NEB., August 4, 1886.

TEST FOR NITRITES IN WATER.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In a recent number of the THERAPEUTIC GAZETTE there is a reference made to a test for nitrites in water.

In the description given naphthylamine hydrochloride is mentioned, but there has accidentally been omitted the sulphanilic acid, which is also necessary.

This has probably arisen from its having been mistaken for sulphuric acid, which is also required.

The test is usually performed by adding to the water a solution of sulphanilic acid, then pure sulphuric acid, then a solution of naphthylamine hydrochloride.

Since without the first-mentioned body the

red color of the nitrites does not appear, a serious error might be occasioned.

It would be well, therefore, in the next number of the journal to call attention to this omission.

Yours,

HENRY LEFFMANN, M.D.

PHILADELPHIA, PA., August 6, 1886.

Notes and Queries.

WAS IT LEAD PARALYSIS?

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—July 15, C., aged 60, good family history, never sick, addicted to the use of alcoholic stimulants, came to me with wrist-drop paralysis of the extensors of carpus and phalanges of the right hand. The night previous he had gone to bed feeling well, but on arising in the morning he found his hand in the above-described condition.

I questioned him closely, but could find no symptoms of lead colic. Bowels were regular; no pain; appetite good; no metallic taste in mouth; the gums showed no appearance of a blue line.

The only thing that I had on which to base my diagnosis was that he was in the habit of carrying lead seals for freight-cars in his mouth from one car to the other. He had been doing this a number of years. I did not begin treatment for a week, at his request, he thinking it was only a sprain.

I then began the use of the interrupted galvanic current daily, giving strychnine and iodide of potassium internally. In four weeks he was completely cured, and now he says his hand is as good as ever.

The question is, If this was not lead paralysis, as I diagnosed it, what was it?

I would be pleased to hear from some of the many readers of the GAZETTE about this.

J. S. APPLEMAN, M.D.

STRYKER, OHIO.

HOPEINE.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—You seem to be in considerable doubt about the composition and properties of "hopeine." A judicial decision from this State will settle the matter for you, for, as far as my recollection serves me, about the time of the Centennial the Eastern article was identical, only a little inferior, to the Western.

Under the new prohibition law of Iowa no alcoholic drinks are vended. Hopeine is extensively sold. HOPEINE is on many a sign where saloons were wont to be kept. One of these places was arraigned for illegal selling. Several witnesses were called who affirmed, under oath, that they had partaken of hopeine and nothing else. The case rested. "Do you know," said the judge, to one of the witnesses, "the difference between beer and whiskey when you taste it?" The witness said he did. "Now," said the judge, "you will tell the jury whether hopeine that you drank was beer or whiskey, and you will be committed to jail for contempt until you answer the question." "It was *beer*," said the witness. F.

CLINTON, IOWA, July 24, 1886.

[At last we know what hopeine is. It is not the alkaloid of American hops; it is not morphine, cocaine, or atropine. It is beer.—EDS.]

PRECAUTIONS AGAINST CHOLERA.

In view of the terrible ravages of Asiatic or epidemic cholera in Europe during the past eighteen months, in which time it has numbered its victims by tens of thousands, and of the fact that it is constantly invading new regions on that continent, showing an especial preference for the shores of the Mediterranean, with which our country has extensive and intimate commercial relations, the State Board of Health of Pennsylvania has deemed it wise to issue a few concise rules, the observance of which will tend to check its spread should it reach our shores. That it has not done so already is not due to any change in the epidemic character of the disease, but simply to the fact that the United States Government has at length awakened to a sense of its responsibilities as the guardian of the health of its citizens, and adopted wiser and more stringent measures than ever before to prevent the scourge from starting on its voyage of destruction. It is too much to hope, however, that it can be entirely shut out, with the limited appliances at present at the command of our authorities. Let not the fact that the warm season is over engender a false sense of security. In one of our recent epidemics the first cases appeared in the month of December, and, with the favoring conditions of the following summer, the pestilence burst forth. It is the part of wise generalship "in time of peace" to "prepare for war," and not wait until the foe is upon us, and mad panic sunders all

ties and paralyzes all resistance. The Board, therefore, suggests as of the utmost importance the following

PREVENTIVE PRECAUTIONS.

Filth is the home, nest, and breeding-place of cholera. The removal of filth beforehand is of infinitely more use than its attempted disinfection after the epidemic has begun. To this end it is essential:

1. To examine the condition of all public water-supplies, and, if pollution is discovered, to cut off its source.

2. To examine the surroundings of all private wells with reference to the existence of causes of pollution.

3. To remove all house refuse, offal, and garbage from the neighborhood of habitations, and either bury or burn it.

4. To use copperas, dry or in solution (a pound to the gallon of water), in all places which are in the least offensive.

5. To examine thoroughly all house-plumbing and drainage, and remedy defects.

6. To thoroughly and frequently cleanse all cellars, out-houses, stables, and hog-styes, using whitewash freely.

7. To drain all wet places in the immediate neighborhood of dwellings; and to drain, ventilate, and, if necessary, cement damp cellars.

The organization of local boards of health in every city, borough, and township in the Commonwealth during the coming winter is of the utmost importance to aid in carrying out these suggestions, and local boards already in existence should act with energy and despatch. Should our quarantine authorities, national and municipal, who are, hourly, on the alert to prevent the introduction of this particular disease, be successful in their benevolent, devoted, and patriotic efforts, it will be a satisfaction to know that no pains taken, no labor expended, no expense incurred in improving the sanitary condition of our towns and our homes, will have been wasted. These measures must inevitably result in diminishing the prevalence of other diseases which we have always with us, and which, in the long run, therefore, carry off more victims than cholera in its comparatively short, though terrible, stay. Should it make its appearance, after we have thus put our habitations and surroundings into the complete state of preparation above recommended, we may view it with comparative indifference. It will not be wise, however, in its presence to neglect certain

PROTECTIVE PRECAUTIONS.

The cholera poison, whatever it be, is taken into the system through the mouth,—that is, IN FOOD OR DRINK. Simply being near a cholera patient cannot give you the disease. Therefore, have no fear of visiting a cholera-infected house on an errand of necessity or of mercy, or even of nursing a cholera-stricken relative or friend. Still further, there is strong ground for believing that the natural juices of a healthy stomach will destroy the vitality of this poison. In Europe last year the greatest number of new cases were usually reported on Monday mornings, Sunday being the day for dissipation among the working classes, and thus leaving them with disordered stomachs, incapable of destroying the activity of the virus before it reached the bowels, where alone it has the power of doing injury. It is, therefore, of the utmost importance to preserve a vigorous digestion by observing a few simple PERSONAL PRECAUTIONS: (1) Avoid all excesses in food or drink, and especially in alcoholic drinks. (2) Take your meals at regular intervals, and do not go into an infected house on an empty stomach. (3) Avoid all intense excitement, violent exercise, colds from undue exposure, and the immoderate use of ice-water. (4) Do not restrict the range of your diet suddenly or exceedingly. (5) Keep the skin in active condition by frequent bathing of the whole body with tepid water, and never eat without first washing the hands carefully. Cholera rarely attacks those who lead healthy, cleanly lives. Its victims are usually found among the dissipated, the careless, and the dirty.

While thus placing your body in a thoroughly defensive condition, do not overlook the importance of PRECAUTIONS IN REGARD TO FOOD: (1) Look upon unripe or over-ripe fruit or vegetables as so much poison, and do not allow your children to have pennies to buy the half-decayed fruit offered for sale on the street-stands. (2) It has been abundantly proved that heat destroys the potency of the cholera poison. Therefore, use no water for drinking, or for washing cooking and table utensils, which has not been thoroughly boiled. You will also err on the side of safety if you eat no uncooked fruit or vegetables. (3) Milk is especially liable to convey infection, and should, therefore, always be boiled. (4) If you use a filter, see that your water-cooler is rinsed carefully every day, and that the filtering material is frequently washed or changed.

(5) As sulphuric acid has been proven to possess the power of destroying the infectious material of cholera, if there is the slightest reason to suppose that the water is polluted, use the additional precaution of adding a tablespoonful of dilute sulphuric acid to every gallon of drinking water. This quantity will not render the water unpalatable. A little sugar may be added, however, if the acid is distasteful. In case of diarrhœa coming on, this acid mixture may be taken of six times the above strength, and frequently repeated in small doses until a physician can be summoned, which should always be done immediately, if the epidemic is a virulent one, the patient meanwhile remaining on his back. (6) As the infection may be carried in clothing, do not send your own to public laundries. That of cholera patients may be washed in the same water, and the disease may thus be brought back to your own house.

Should a member of your family be attacked with the disease, keep the patient in the house, as removal might be fatal, and send away the well members as far as practicable. Use the following

PRECAUTIONS IN THE SICK-ROOM.

(1) All carpets, curtains, and clothing not in use, contents of bureau-drawers and wardrobes, books, etc., should be removed from the sick-room at the earliest possible moment. The infection resides in the discharges of the patient, whether from the stomach or the bowels, but especially from the latter; therefore (2) All such discharges should be received in a vessel containing about a pint of disinfecting solution, thoroughly mixed, and allowed to stand fifteen minutes, if possible, before emptying. If in the country, they should then be buried at least eight inches under ground, and remote from any well or running stream. (3) Any clothing, bedding, towels, napkins, or handkerchiefs, soiled by a patient, should at once be immersed in a strong disinfecting solution, allowed to remain four hours, and then boiled or exposed to dry heat for four hours (230° Fahr.). (4) After the recovery or death of the patient, as much of such clothing as can be dispensed with should be burned. All utensils used by the patient should be placed at once in a disinfecting solution before being washed. (5) During convalescence all the discharges of the patient must be treated as if they were fresh cholera discharges. (6) The dead should be enveloped in a sheet saturated with a disinfecting solution without previous washing of the body, and at once placed in a coffin. Burial should be immediate and private. The Board recommends the following

DISINFECTING SOLUTIONS,

principally suggested by the Committee on Disinfectants of the American Public Health Association:

For the Disinfection of the Discharges from the Patient.

1. *Standard Solution, No.* 1.—Dissolve chloride of lime or bleaching powder of the best quality (containing at least twenty-five per cent. of available chlorine) in soft water in the proportion of four ounces to the gallon.

2. *Standard Solution, No.* 2.—Dissolve corrosive sublimate and permanganate of potassium in soft water in the proportion of two drachms of each salt to the gallon.

(NOTE.—1. This solution is highly poisonous. 2. It requires a contact of one hour to be efficient. 3. It destroys lead pipes. 4. It is without odor.)

3. *Standard Solution, No.* 3.—To one part of Labarraque's Solution (*liquor sodæ chlorinatæ*—U. S. P.) of hypochlorite of sodium add five parts of soft water.

(NOTE.—Competent authority has pronounced this superior to all other disinfectants.)

For the Disinfection of Clothing, Towels, Bedding, and other Textile Fabrics.

Standard Solution, No. 4.—Dissolve corrosive sublimate in water in the proportion of four ounces to the gallon, and add one drachm of permanganate of potassium to give color to the solution as a precaution against poisoning. One fluidounce of this solution to the gallon of water is sufficiently strong. Articles should be left in it for two hours. One gallon of standard solution, No. 1, may also be mixed with nine gallons of water, and used in the same way. No article should be allowed to leave the infected room until it has been either disinfected or boiled.

(NOTE.—Corrosive sublimate solutions should be kept in wooden or crockery vessels.)

For the Disinfection of Water-Closets, Urinals, Sinks, and Cesspools.

4. *Carbolic Acid Solution.*—Mix one pint of carbolic acid with two and a half gallons of water.

Standard solution, No. 4, diluted with three parts of water, may also be used in the proportion of one gallon (of the solution) to every four (estimated) of the contents of the vault. Standard solution, No. 1, would require to be used gallon for gallon of the

material to be disinfected. Dry chloride of lime may be sprinkled over the contents of a privy, or standard solution, No. 2, may be made up by the barrel, and four or five gallons be applied daily during an epidemic.

For Disinfection of the Sick-Room after it is Vacated.

Thorough ventilation for several days, and thorough washing of all surfaces with one of the disinfecting solutions, say, one pint of standard solution, No 4, to four gallons of water, or a quarter of a pint of solution of hypochlorite of sodium to a gallon of water. The walls and ceiling, if plastered, may be washed with this, and then whitewashed. All dust must be carefully washed (not brushed or swept) away from ledges, cracks, corners, and crevices.

5. *Sulphuric Acid Solution.*—Sulphuric acid or oil of vitriol is often accessible when other disinfectants are not, and is very effective, in the proportion of one ounce to the gallon of water, for disinfecting cholera stuff (discharges); of the same strength for soiled clothing; and of half this strength for bathing the body of the sick or the hands of the attendants, or sponging the clothing of attendants and the floor and carpets, if they become soiled.

A CASE OF CYSTIC GOITRE TREATED BY "SHELLING OUT."

MR. WILLIAM DUFF reports the following case in the *Lancet* for July 3, 1886:

Annie Z., aged 23, married, was admitted on July 23, 1885, suffering from a tumor on the right side of the neck. She had enjoyed good health until five years ago, shortly after marriage, when a swelling commenced to form over the right side of the thyroid gland, and continued slowly and persistently to enlarge. She had one child a year and a half ago, but neither pregnancy nor lactation seemed to influence the growth. On admission a tumor about the size of a cocoanut occupied the position of the right lobe of the thyroid gland, and passed somewhat over to the left of the middle line of the neck. The skin, with a few enlarged, subcutaneous veins, was freely movable over the swelling, which moved with the trachea in the act of swallowing. Fluctuation could be felt all over it, more distinct in some parts than others. Neither breathing nor swallowing was seriously interfered with. About three weeks before admission a teacupful of bloody serous fluid was withdrawn by a trocar and canula, and the tumor was considerably reduced in size, but reaccumulation took place in a day or two. By August 11 the tumor had attained a larger size than ever, the circumference of the neck being seventeen and three-quarter inches. The patient was informed that if the tumor remained serious results might ensue, and she consented to an operation.

Ether having been administered, Dr. Vachell proceeded, on August 12, to remove the tumor under the carbolic spray. A vertical incision, measuring about two and one-half inches long, was made through the skin over the most prominent part, and at once the surface of the tumor came into view, the capsule of the gland, if present, having been so thinned by pressure as to present no difficulty. Up to this point very little hemorrhage had occurred. Without much difficulty the tumor was now shelled out, but the hemorrhage, which commenced with this process and continued throughout, was very profuse. Firm pressure was maintained by an assistant, the surface was mopped with very hot water mixed with tincture of iodine (1 in 20), and as bit by bit the surface was exposed all the bleeding points were ligatured. The edges were then brought together and a drainage-tube inserted.

After the operation the progress was satisfactory. Some sickness in the afternoon and a troublesome cough led to considerable oozing, necessitating the dressing of the wound in the evening. The dressing was repeated the next day. On the 14th the tube was shortened, and on the 16th the stitches were removed. On the 19th boric dressing was substituted, and on the 24th the patient left the infirmary.

The temperature rose on the evening of the day of the operation to 103.8°, and remained more or less febrile till the 19th. Probably this was due to an attack of bronchitis, from which she then suffered.

The tumor, which was irregularly ovoid in shape, measured thirteen inches by nine inches, and weighed twenty ounces. On being cut into, nine ounces of dark sanguineous fluid escaped, similar to what had been removed by tapping, but darker. The walls varied from one-sixth of an inch to rather over half an inch in thickness, and consisted of material resembling heart muscular fibre in naked-eye appearance. The internal surface was much and deeply corrugated.

ATROPINE-POISONING.

JULIUS KRATTER records in *Schmidt's Jahrbücher* of June 1, 1886, his observations made in eight cases of poisoning by atropine or belladonna treated in the hospital at Graz. The first case was a slight poisoning provoked by seven powders of 0.01 grm. (⅙ grain) of the extract of belladonna; the second, a grave intoxication caused by seven suppositories of 0.05 grm. (1 grain) of the same extract; the third, fourth, and fifth cases, all of which were likewise serious, were the result of eating the berries of belladonna by mistake. In the sixth case, an auto-intoxication by the berries of belladonna, maniacal phenomena presented themselves, followed by a profound coma, and death on the third day.

The clinical appearances deviated but little from the well-known group of symptoms of atropine-poisoning. In several cases the dilatation of the pupil was the first symptom observed. Kratter emphasizes the fact that in all these cases the temperature was distinctly elevated, though all text-books speak of a reduction of the temperature in atropine-poisoning. In a case observed by Fritz Strassmann, of Berlin, the temperature was likewise found to be raised. *Vide Schmidt's Jahrbücher, loco citato.*

ADMINISTRATION OF TEREBENE.

The following formulæ for preparations of terebene are taken from the *Colonial Druggist* (reprinted in *Nat. Drugg.*), and will be found convenient to druggists, for they are usually applied to by the physicians for the proper combinations to administer new remedies (*American Druggist*, July, 1886):

Terebene is employed as a remedial agent not only in cases of "winter cough," phthisis, dyspepsia, etc., as related by Dr. Murrell, but also in various affections of the alimentary canal, in certain skin-diseases, and as a disinfectant; this has naturally created a considerable demand for this preparation.

The ordinary mode of taking terebene—"10 drops upon a lump of sugar"—has several disadvantages, not the least of which is that the sugar, if thoroughly impregnated with the hydrocarbon, is rendered—for some time at least—practically insoluble in water or saliva; it has, therefore, either to be crushed by the teeth and well masticated, or else retained in the mouth for an inconveniently long period. The linctus given below will be found far more convenient, as well as more palatable:

℞ Terebene, f℥v;
Powdered gum-arabic, f℥iv;
Syrup of tolu, f℥i;
Strained honey, f℥ii;
Tincture of saffron, q.s.;
Water, q.s.

Mix intimately in a small mortar the terebene and the powdered gum; emulsify carefully with 1½ ounces of the water, adding the syrup of tolu gradually towards the last. Stir in the honey until the whole has become smooth; make up to the measure of 6 fluidounces, and color with a few drops of the tincture of saffron. The dose is one teaspoonful. This linctus keeps well, and is generally appreciated, even by young children, while in a variety of throat affections it gives speedy relief, although free from narcotics; observations which also apply to

TEREBENE COUGH MIXTURE.

℞ Terebene, f℥i;
Powdered gum-arabic, ℥iv;
Powdered sugar, ℥iii (troy);
Yolk of eggs, 2;
Anise water, f℥ii;
Camphor water, f℥iv;
Distilled water, q.s.

Mix the two powders in a mortar, and stir in the terebene. Emulsify with the yolk of eggs, and the aniseed and camphor waters previously well beat up together. When perfectly smooth, make up with water to the measure of 8 fluidounces. Dose: One teaspoonful as often as may be necessary. An acidulous modification is as follows:

℞ Terebene, f℥i;
Powdered gum-arabic, grs. xxx;
Powdered sugar, ℥i (troy);
Yolk of eggs, 2;
Syrup of lemon, f℥iii;
Water, q.s.

Proceed as previously directed, only emulsify with a very little plain water before adding successively the yolk of eggs and acid lemon syrup. If the eggs be not "new laid," it may be as well to beat up the yolks with about 20 or 30 minims of diluted phosphoric acid before stirring the same into the other ingredients, as before. Make up to 8 ounces. Both this and the preceding mixture may be tinted, if desired, with a little saffron or caramel.

This mixture should contain about 16 grains of citric acid to the fluidounce; therefore, if the lemon syrup used is not strong enough in this respect, a little powdered citric acid must be added to make up the deficiency.

PASTILLES OF TEREBENE.

℞ Terebene, 80 to 100 grms. (1 gr.= 15 grs.);
Gum-arabic, 400 grms.;
Powdered tragacanth, 200 grms.;
Powdered loaf-sugar, 500 grms.;
Glycerin, 30 grms.;
Oil of lemon, 12 grms.;
Egg (white of), 5 or 6.

Dissolve the oil of lemon in the terebene, and add the mixture to all the powdered gums and 100 grammes of the sugar. When thoroughly incorporated, emulsify with the smallest convenient quantity of water, and add the glycerin and the egg albumen, the latter having been well whisked. Transfer to porcelain or enamelled iron vessel heated by a water-bath, and, when warm, slowly sift in the fine sugar as it dissolves in the viscous fluid. Stir constantly, and evaporate until a little dropped upon a cold plate becomes, after ten minutes, of a sufficiently firm consistence. Pour out to the depth of about half an inch upon cold tin or porcelain plates, which have first been dusted over with finely-sifted dry starch. When cool, divide the stiff, dough-like mass into squares or diamonds of suitable dimensions, using a mixture of one part white sugar and three parts starch, perfectly dry and in fine powder, to prevent sticking. A small sugar-sifter, or "dredger," will be needed during this operation. These pastilles may be safely given to the youngest children, and for persons of old age are very efficacious in dislodging both phlegm and flatus.

AROMATIC TEREBENE FOR DISINFECTION.

℞ Terebene, ℥ii;
Eucalyptol, ʒiii;
Thymol, ♏xx. M.

Put up in "sprinkler" bottle, and impregnate small pads of cotton, wool, bran, "wads" of lint, blotting-paper, etc., and hang them about the apartment some two and a half to three feet from the ground, especially in such situations where a draught from door or window is likely to cause currents of air to pass over them occasionally.

AROMATIC TEREBENE SPRAY.

The disinfecting mixture just mentioned, either by itself, or, preferably, dissolved in an equal bulk of strong alcohol, or Larbalestier's eau de cologne, is shaken up in an atomizer with ten parts of plain water. When "sprayed," a refreshing fragrance is imparted to the air, and septic fermentation cannot take place therein.

THE INFLUENCE OF GASTRO-INTESTINAL AFFECTIONS OF CHILDREN ON THEIR BODILY WEIGHT.

DR. NAKATSU MIYAMOTO (of Japan) communicates to the *Arch. f. Kinderheilkunde*, 1886, vol. vii., Nos. 3, 4, the results of his observations on the influence of gastro-intestinal troubles of children on their bodily weight. He examined for the purposes stated, dyspepsia, ten cases; intestinal catarrh, fifteen cases; enteritis follicularis, eight cases; cholera infantum, six cases. His conclusions are thus formulated: (1) dyspepsia invariably and manifestly decreases the weight, often causing a daily loss of thirty-three grammes (one ounce). (2) Intestinal catarrh has very similar consequences. (3) In enteritis the loss is far heavier, at times amounting to twenty ounces *pro die*. (4) Cholera infantum causes, of all stated affections, the greatest reduction in weight in the shortest time, amounting occasionally to a loss of one-tenth of the entire weight within twenty-four hours. These cases, of course, are all fatal.

REMARKABLE ACCIDENT WHILE TAPPING A HYDROCELE.

A rare and remarkable accident during the ordinary operation of tapping a hydrocele is reported from Bordeaux. The patient was a healthy peasant of 44 years of age, who had never suffered from any venereal affection. The hydrocele, which was on the right side, had been in existence some two years, and had followed an accidental blow. As it continued to increase in size, he sought advice, and was admitted into M. André Boursier's clinic. When the trocar was introduced, about one hundred and twenty-five grammes of straw-colored fluid came away. M. Loumeau, who performed the operation in M. Boursier's presence, then, having satisfied himself that the extremity of the canula was free in the cavity of the tunica vaginalis, proceeded to inject gently 60 grammes of a mixture of tincture of iodine with twice its volume of water. All at once the patient complained of severe pain in the cord and the loins, with cramp in the right forearm. The ulnar border of the right hand then became flexed, the ring and small fingers being completely flexed, while the index and middle fingers, though extended as far as the second and third phalanges were concerned, were flexed at their metacarpo-phalangeal articulations. The thumb also was flexed and brought near the fingers. Exactly the same position was shortly

afterwards assumed by the left hand. There were no convulsions or syncope. After a few minutes the "ulnar *griffe*" began to relax, and the index and middle fingers became flexed completely on the hand, which itself became strongly flexed on the forearm. All the muscles on the front of the forearm became hard and contracted. The palmar fascia was strongly retracted, and the palmaris brevis quite tense. On both sides the ulnar affection had given place to contraction of the muscles supplied by the median nerve. The patient was unable to articulate a sound, his tongue hanging loosely in the buccal cavity. The muscles supplied by the hypoglossal nerve were also contracted, but for a short time only. The forearms were shampooed, and after nearly an hour the muscles relaxed. The patient recovered completely, and left the hospital after a few days. M. Loumeau has been unable to find an example of this kind in medical literature; but M. Desplats, of Lille, published a paper on pleural eclampsia last year in the *Semaine Médicale*, in which he refers accidents connected with pleural operations to four categories: (1) toxic action of the liquid injected, (2) true epilepsy, (3) uræmia, (4) reflex action. The author surmises that the accident was due to reflex irritation of the nerves of the serous membrane by the liquid injected. The testicle, it may be remarked, was in no way injured. Whatever explanation may be offered, the fact remains, which is itself sufficiently extraordinary, of a healthy peasant man of middle age being thrown into a state of severe nervous spasm by the performance of a very simple and very common surgical proceeding.—*Lancet*, July 3, 1886.

TUBERCLE-BACILLI IN THE URINE.

Dr. Kirstein reports in the *Deutsche Med. Wochenschrift* (1886, vol. xii., No. 15, p. 249) the clinical history of a case of grave septic cystitis in which, by the discovery of tubercle-bacilli in the urine, he could diagnose the simultaneous existence of tuberculosis of the bladder. The copious sediment, consisting chiefly of septic and purulent matter, rendered the recognition of the bacilli of course extremely difficult. They could only be found in one out of forty sections. To facilitate the finding of the microbes, Kirstein proposes the following procedure: The sediment is transferred to a cup-shaped glass, well stirred with a glass rod and filtered; then the residue is poured on a watch-glass, some of the matter crushed between two slides, and treated in accordance with Ehrlich's method. The result of this procedure was the finding of bacilli in each of the preparations thus obtained.

POISONED BY WILD FLOWERS.

About a fortnight since, a little girl, aged 7 years, died at Glasgow, as alleged, from having sucked the bloom of some poisonous wild flower. The child had been taken on a Sunday-school excursion into the country. During their ramblings wild flowers were gathered, and posies were arranged and garlands woven, as is the wont with children set free from the care and discipline of schools and allowed to roam fancy free in meadows and by hedgerows. In their delight at nature's fairest gifts, little did the denizens of the big Scotch town dream of the poison that lurks within the spathe of the cuckoo-pint (*Arum maculatum*), or in the clusters of purple blossoms of the woody nightshade (*Solanum dulcamara*). In fact, the flower of this plant is so like in form and arrangement to that of its innocent first cousin, the esculent potato, that we can understand how a knowledge of the harmlessness of the culinary tuber may have suggested a riskless indulgence in the flowerets of the former. In these days of school-board exaction, is it too much to ask that our children should be instructed, if only in simple fashion, in the broad principles of botany and zoölogy, and taught how to recognize the plant that nourishes and the one that kills,—the harmless snake and the poisonous adder? It is not necessary to go into technical details and to use harsh scientific words to instil into a child's mind that which may be of good service to it when brought in contact with the floral beauties of spring and early summer, or with the berry clusters of a later season. What could be more interesting to a hard-worked, brain-wearied little wanderer in God's garden than to learn the way to recognize the difference between the garnishing parsley and its deadly relative whose name is the antithesis of him that is wise, or its still more poisonous effigy, the classic hemlock, growing in shady nooks? We might mention a hundred other instances,—*e.g.*, the creeping hairy bryony, with its festooned wreaths of scarlet berries, hard by its rival, the common tamus, with leaves of shining green, growing bronzed and sombre as the autumn of its vegetative life approaches. We could tell that the simple

dropwort, or spiræa, has no right to have its title disputed by the water dropwort or the hemlock water dropwort, with which it holds no natural affinity. We could warn against the perfidy of the gaudy foxglove and the sedate but deadly nightshade, and so on ; but enough has been written to merit the sympathy of our Board of National Education, and to make them consider that the fields around us are the true fields of learning.—*Lancet*, June 26, 1886.

ON LESIONS OF THE CORNEA FOLLOWING THE INSTILLATION OF COCAINE.

Numerous instances have now been recorded in which the use of cocaine has been followed by local ill effects : these may be divided into two classes, namely, suppurative panophthalmitis and lesions of the cornea. The former being, in all probability, due to septic infection, cannot be said to depend directly upon the use of cocaine, except in so far as cocaine increases the absorbent properties of the cornea (a subject that will be considered presently), and direct inoculation occurs from impurities in the solution used.

The corneal lesions which have been observed are of two kinds : (1) an affection of the epithelial layer only, consisting of vesication or desquamation, and (2) interstitial opacities, often taking the form of a kind of striated keratitis extending from the wound.

One of the first to observe the superficial changes was Paul Bunge (*Klin. Monatsbl. für Augenheilk.*, 1885, p. 402), and very many instances have been recorded since. In some of these, the case has not been complicated by the employment of any antiseptic solution, a point which, as will presently be seen, is of considerable importance. There can, therefore, be no question that the vesication and desquamation which occasionally follow the use of cocaine are really due to the action of the drug.

With the view of ascertaining how cocaine produces this effect, Würdinger has recently conducted some experiments upon animals (chiefly rabbits, but also upon dogs and guinea-pigs) (*Klin. Monatsbl. für Augenheilk.*, April, 1886). In addition to the anæsthetic action of cocaine, one of its most marked effects is the dryness of the surface of the eye which it causes ; this is probably due chiefly to the anæmia of the conjunctiva and the diminution in the lachrymal secretion from constriction of the blood-vessels ; but it is probably increased by the wide opening of the palpebral fissure that usually occurs, and the absence of the natural and involuntary blinking movements.

In order to ascertain how far the changes in the corneal epithelium were due to these causes, Würdinger instilled a drop of a five per cent. solution into both eyes of a rabbit, at intervals of four minutes. The one eye was kept closed between the instillation, but the other remained open.

In the closed eye, no changes whatever took place in the appearance of the cornea. In the other eye, after three or four minutes, slight changes were noticed ; these increased, and, in twenty to twenty-five minutes after the cocaine had been commenced, the cornea presented a superficial and fine roughness, as well as depressed areas, which looked as if they were caused by the shedding of the epithelium. After an hour, the turbidity of the cornea had increased so much that the condition of the iris could no longer be made out.

Further experiments showed that the intensity of the changes depended more upon the duration of the experiment than upon the concentration of the solution, or the frequency with which it was applied. By dropping distilled water upon the cornea, between the applications of the cocaine, changes which had already occurred were not removed, but their increase was prevented. Microscopic examination of the altered areas showed that the epithelium, where not removed, was thinned out, and that there was also considerable thinning of the anterior layers of the true corneal tissue.

As regards the interstitial opacities of the cornea, Dr. Wood-White (*Ophthalmic Rev.*, January, 1886, p. 6) appears to have been the first to suggest that they were due, not to the cocaine itself, but to the simultaneous employment of a solution of corrosive sublimate. He states that he has frequently used cocaine alone, and in conjunction with boracic acid, and has never seen any ill effects arising from it, but that in the only cases in which he at the same time used a solution of corrosive sublimate (five cases of cataract extraction), a pearly-white opacity, extending from the wound, was visible on the second day ; this cleared up completely in all the cases in a few days.

Dr. Wood-White has omitted to state the strength of the solution of corrosive sublimate used by him, and also whether he has used the same solution alone in other cases ; but, assuming that the solution was of the strength ordinarily employed, the conclusion seems a reasonable one that the effect produced was

in some way dependent upon the combined action of the cocaine and corrosive sublimate; and some of Würdinger's experiments appear to support this.

Dropping fluorescine into a cocainized and into a non-cocainized eye at the same time, Würdinger found that in the non-cocainized eye only the superficial layers became fluorescent, but that in the cocainized eye the deeper layers also became affected. When the epithelium was removed from a limited area, and "methyl-blau" was dropped upon the abraded surface, it alone became colored in the non-cocainized eye, while in the cocainized eye the coloring matter extended through the whole cornea. It seemed clear, therefore, that the effect of the cocaine was to increase the absorbent power of the cornea. Finally, Würdinger found that weak solutions of boracic acid, corrosive sublimate, and even of common salt, which in the normal eye were perfectly innocuous, in the fully-cocainized eye produced a turbidity of the cornea, identical with the early stage of the striated keratitis which sometimes follows cataract extraction.

If subsequent experiments should verify these conclusions, it is evident that the views at present held as to the advisability of employing corrosive sublimate as an antiseptic will have to be considerably modified. It is of the utmost importance that these investigations should be carried further, in order to ascertain what is the weakest solution of corrosive sublimate capable of producing the lesions described, and the weakest that is efficient as an antiseptic. In the mean time steps should be at once taken to ascertain whether any interstitial lesions of the cornea have ensued when cocaine has been used alone. It is significant that most of the reported cases have been furnished by institutions in which corrosive sublimate is used as a matter of routine; but in many instances it is not stated whether it was actually used or not, the point not being considered of any importance at the time of publication.—*British Medical Journal*, August 7, 1886.

THE INCOMPATIBILITY OF CHLORAL WITH POTASSIUM BROMIDE AND ALCOHOL.

We have in previous issues referred to the peculiar incompatibility exhibited by chloral in the presence of potassium bromide and alcohol, and have given the experiments of PROF. MARKOE in explaining this, together with the various criticisms which his statements called forth. Prof. Markoe again replies to his critics in the *Pharmaceutical Record* for June 15, 1886. The original prescription in which the incompatibility was first noted was composed of the ingredients shown by the following copy:

℞ Potass. bromid.,
Chloral hydrat., āā ʒiii;
Tr. opii et camph.,
Syr. zingiber., āā ʒiss. M.

S.—One or two teaspoonfuls in half a wineglass of water every two to six hours. For sleep.

When this mixture is made up, it always results in the formation of two layers,—a dark-colored liquid floating upon a light-colored denser liquid.

The writer explained this decomposition as due to the change of the chloral hydrate into the less soluble chloral alcoholate, the alcohol being furnished by the paregoric elixir called for in the prescription.

Three experiments were then detailed, in which the endeavor was made to prove that the alcohol was the sole cause of the trouble.

These experiments were printed in the following form in the volume of the Proceedings, as well as in all the reprints of the paper:

1. Potass. bromid., grs. lx;
Chloral hydrate, grs. lx;
Water, fʒvi;
Syrup of ginger, fʒvi.

These articles formed a perfect solution, which did not separate on standing.

2. Potass. bromid., grs. lx;
Chloral hydrate, grs. lx;
Water, fʒiii;
Alcohol, fʒiii;
Syrup of ginger, fʒvi.

In this experiment it will be noted that the ingredients differ from the original only in the substitution of diluted alcohol for the paregoric. After standing a short time this mixture separated into two layers, the upper being of a light straw color.

3. This experiment was with the same ingredients as in No. 2, except that the alcohol was not added until after the mixture had been standing an hour. No separation took place before the addition of the three fluidrachms of alcohol, but the separation occurred promptly after the addition of the alcohol. These experiments prove that the alcohol is the cause of the trouble, and the writer thinks that the chloral hydrate is

changed into the less soluble chloral alcoholate.

A careful reader would have readily seen that the writer's intention was to take just one-half the quantity of the original prescription for the experiments 1, 2, 3, which would require 90 grains of each of the salts ordered in place of the 60 grains as printed. Most of the critics did not take the trouble to try the experiment with the original prescription, but repeated experiments 2 and 3, using only 60 grains of each of the salts, and, finding no separation, at once jumped to the conclusion that the thing was all wrong. The misprint, due to a blunder in making hectograph copies of the original paper, was corrected in some of the pharmaceutical journals.

An English critic, in a very courteous note to the *Pharmaceutical Journal*, took exceptions to the statement that alcohol was the sole cause of the decomposition, and claimed that the presence of sugar was necessary for the separation of the chloral compound.

The following experiments will dispose of this criticism:

4. Potassium bromide, grs. xc;
Chloral hydrate, grs. xc;
Water, fʒiv;
Alcohol, fʒii.

The salts were dissolved in the water, forming a clear solution; on the addition of the alcohol and shaking together, the mixture became milky, and on standing separated into two layers, the upper forming somewhat more than a fourth of the whole.

5. Like No. 4, but having three fluidrachms of alcohol; behavior like No. 4.

It will be seen, therefore, that the presence of sugar is not needed to produce the separation of the chloral; it is only necessary that we have very strong solutions of chloral and bromide. The addition of more alcohol, or dilution with water, will restore a perfect solution of the separated chloral compound.

The presence of sugar will greatly facilitate the decomposition, by allowing it to take place in weaker solutions.

TREATMENT OF ANGIOMA.

Dr. Böing has treated five cases of angioma in children of 2 to 9 months old by daily brushing the tumor with a four per cent. solution of sublimate collodium for four consecutive days. The result was in each case very successful.

POISONING BY SAUSAGES.

Familiar as is poisoning by sausages, there yet remains much to be learnt of the manner in which the poison or poisons act. Sometimes an inorganic poison has been suspected, but generally it is supposed that the deleterious agents are in some way related to the occurrence of decomposition in the organic contents of sausages. Nauwerck, of Tübingen, has investigated a series of cases of poisoning by sausages, and has come to the conclusion that the symptoms were to be largely attributed to the agency of certain complex bodies that are known to be derived from the decomposition of albumen. Some of the symptoms of sausage-poisoning are of considerable interest, such as the paralysis of accommodation for near objects of vision, also the dilatation of the pupil and drooping of the upper eyelid. It does not follow that sausages are harmless because a chemical examination of them has failed to detect poison in sufficient quantity to prove noxious to the organism. The sausages in these cases may simply contain the germs of decomposition, and not begin to decompose until they have reached a suitable site in the intestinal canal of their host. If all sausages contained poison ready formed at the time of ingestion, it would be difficult to understand how it happens that a considerable period of time occasionally elapses before the symptoms of poisoning commence. A study of the mode of action of the various poisons that are evolved during the process of decomposition of albumens has proved of great service to the science of pharmacological physiology.—*Lancet*, August 7, 1886.

LEAD IN TINNED PROVISIONS.

Dr. Rabchevski, of St. Petersburg, has published the results of a series of investigations made on various kinds of tinned provisions, with the view of determining the suitability of food preserved in this way for the purposes of the army commissariat, especially when on active service. He first examined the tinned plates in the preserved provision manufactories, and found them in all cases quite free from lead. The case of the solder was of course different, the amount of lead contained in it varying from sixty to seventy per cent. The chemical examination of the contents of the tins was conducted by Pouchet's method, and showed that while some classes of food, such as roast meat, were quite free from lead, others, such as sour cabbage,

which to a Russian is a very important article of diet, contained very appreciable quantities of lead, in one case as much as 0.327 per cent.; so that a man taking 200 grammes, or about a quarter of a pound, of this for his dinner would introduce into his system 0.654 grammes, or about 8 grains, of lead,—a quantity which, especially if taken frequently, can by no means be considered as harmless. The conclusion arrived at by the author is that these tinned provisions should only be used in the army in case of urgent need, and for a very short time. It would appear, too, that a choice might be made; only such classes of preserved food being accepted by the authorities as were shown to be least likely to become contaminated by the injurious substances contained in the solder.

GASEOUS MEDICATION PER RECTUM.

The ingestion of gaseous medicines by the lower bowel was the subject of a recent communication by M. L. BERGEON to the Paris Academy of Sciences (*Comptes Rendus*, July 12). His research has extended to a variety of diseases, but for the present he only records his experience in the treatment of pulmonary phthisis. After having tried a variety of balsamic substances of parasiticide or antiseptic repute, M. Bergeon gave the preference to sulphurous mineral waters (Eaux Bonnes, Challes, etc.). A current of from four to five litres of carbonic acid gas traversing from two hundred and fifty to five hundred grammes of the sulphurous mineral water was introduced per rectum twice in the twenty-four hours. After a few days' use, cough was notably diminished and almost suppressed, the expectoration greatly modified in quality and quantity, the sweating stopped, and the general state improved; and that not only in incipient, but also in confirmed phthisis. Daily auscultation established the disappearance of moist râles.—*Lancet*, August 7, 1886.

ON HYPNONE.

We learn from the *Münch. Med. Wochenschr.*, vol. xxxiii., No. 14, 1886, that LEUBE has seen good results from hypnone, which he gave to fourteen patients for some time every evening in the dose of 2 to 4 drops in gelatin-capsules. Four, and even 2 drops, sufficed usually to procure a quiet sleep lasting several hours. In phthisical patients the drug seemed to act particularly well. Its action appears one-half to one and a half hours after its ingestion. Untoward effects were not observed except in one instance, where 6 drops caused headache and vomiting after a prolonged sleep.

BROMINE IN DIPHTHERIA.

SEÑOR LOVAT A. MULCACHY, of Buenos Ayres, finds great advantage in cases of diphtheria in giving a solution of bromine. The bromine is simply dissolved in water in the proportion of 1 to 2500. A teaspoonful of this is given every ten minutes. He says that children will swallow it automatically even when asleep. For infants under three years of age the strength may be diminished to half that mentioned above. He cites several cases showing the successful results obtained by this method, but he points out the importance of the administration being continued for some days, and of the medicine being given exactly every ten minutes. As to local caustic applications, he considers that they serve no purpose whatever, but only irritate and distress the patient.—*Lancet*, August 14, 1886.

THE FUNCTION OF THE TONSILS.

DR. R. HINGSTON FOX, in an interesting article on the Functions of the Tonsils, in the twentieth volume of the *Journal of Anatomy and Physiology*, expresses the opinion that these glands belong to the digestive and not the respiratory tract, and that their function is to reabsorb certain constituents of the saliva in the intervals of meals which would otherwise be wasted. He thinks that the view of their having an absorbing function is further supported by the strong evidence of the power of the tonsils to absorb morbid poisons directly from the saliva.—*Lancet*, July 24, 1886.

ANTISEPTIC PAPER DRESSING.

DR. DON ANTONIO MORALES PEREZ describes in the *Revista Médica* of Seville a simplified antiseptic or Listerian dressing, consisting of bibulous paper heated to 110° C. and soaked in a solution of carbolic acid, boracic acid, or corrosive sublimate. This is placed over the wound in about eight layers, and covered with sheet gutta-percha or mackintosh, the whole being secured by an india-rubber bandage. The writer claims for this dressing the advantages of cheapness and portability, and thinks it will be found very serviceable in the field and in small hospitals.—*Lancet*, August 21, 1886.